THE AMERICAN GAS-LIGHT JOURNAL AND CHEMICAL REPERTORY.

Publishing Office, No. 42 Pine Street.

Devoted to the Interests of Illumination, Heating, Ventilation and Sanitary Improvement, Domestic Economy, and General Science, Including Water Supply and Distribution.

VOLUME XXI. No. 11. Whole No. 371. | NEW YORK, WEDNESDAY, DECEMBER 2, 1874. | $3 PER ANNUM IN ADVANCE.

Second Annual Meeting of the American Gas-Light Association.

HELD AT THE POLYTECHNIC INSTITUTE, BROOKLYN, N. Y., OCTOBER 21ST AND 22D, 1874.

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SECOND DAY—OCTOBER 22d, 1874.

The President called the meeting to order, pursuant to adjournment.

The minutes of the evening session were read by the Secretary and approved.

The President—We left off discussing the Olney process.

Mr. Cartwright—In connection with the discussion of that subject, I observe with some degree of satisfaction, the presence of Mr. President Libby. We heard from Capt. White I think, all the poetry and sentiment that is possible to be crowded into that subject, and I for one confess to a disappointment, and under the feeling of disappointment, I would like to hear something that would come down to the substratum of the whole concern. We want to look at it in a commercial and practical point of view, and if it would please the association, and at the same time Mr. Libby would be willing, I would be glad to hear any remarks he may have to offer.

Mr. Libby—I thank the gentlemen of the association for the invitation they have given me. I do not propose to detain you long gentlemen, neither do I propose to make what is properly called a speech. If I can throw out some hints on this question, which will be useful, I would be very glad to do so. I represent no patents and no methods. I represent, in what I say, what to me appear to be simply facts and nothing more; and facts that I look at more in a business point of view, than in the scientific light which you gentlemen give so much time and attention to. My attention was called to this subject through what is called the Rand process. I visited Saratoga with one of our most prominent directors—one largely interested in our company, and a man of clear and practical mind. We examined the process there, and he condemned it entirely. I did not. He condemned it so much that he said he would not be willing to use it, or invest any money in the development of it. There were others that were so strong in the idea that there was something in it, that they were willing to risk something in the experiment, and in the development of what was deemed by many to be a grand improvement in gas making. The idea which came to my mind was a commercial one. I found these facts existing in the manufacture of gas. That we were paying the Pennsylvania Railroad Co. $6 a ton for transporting a coarse, heavy material, over the Alleghany mountains around to New York; an article that costs $1.50 at its start, $8 or $9 when it arrives here. And when it comes here we use not over 20 par cent. of that product for the purpose of illuminating gas; 80 per cent. freight and expenses were paid on this coarse material, in order to get the 20 per cent which we really need. It seems to me to be about as wise for an Iowa or Minnesota farmer to send his wheat straw here, and grind it into flour, or as it would be for a Louisiana sugar manufacturer to send the sugar cane to New York, and to manufacture it after it got here, and to pay the freight and expenses on the raw material. It seems to me that we have not yet got to the extent of our possible improvement; in fact, that we work very much behind it; that we ride in the stage coach and canal boat still, instead of availing ourselves of the more rapid transit—the railroad and steamboat. Now, if you take the amount of money which is consumed in freights, you will see that a very important item or the cost of gas is paid to the railroads. Then we come to the labor question and we find as a matter of fact, and facts that cannot be disputed, that the old process at least costs more than twice as much as the new. These two items to a business man are formidable, and the question is—Can they be overcome? I spoke this morning to the foreman of the department of our works, which is making naphtha gas. Our engineer is familiar with this; it comes to me now, because I spoke to him this morning about it. I said: "How much gas are you making per hour?" He said, "22,000 feet. I said, "Are you averaging 20,000 feet?" He said, "Yes, sir, we did that yesterday." We have four benches which make this 20,000 feet, and multiplied by 24 makes 480,000 in 24 hours. That would be our maximum, perhaps, but 300 000 feet would be an easy day's work. It takes about four or five men to do this work. There is no labor in it—hardly any at all. The foreman sits there looking at his machinery, and one man keeps the fires; that is about all the labor connected with it. You can easily understand what it would cost to manufacture 400,000 feet of gas in the old way. You are all familiar with it. This gas we made yesterday is 18 candle power, measured by the photometer, and combined with the coal gas, gave us yesterday between 16 and 17 candle power. I would not pretend to discuss with you, gentlemen, the chemical and scientific questions which relate to this, but in a general way I have always supposed and know that whatever is illuminating, is in the carbon which the oil is largely possessed of. I consider that the hydrogen is a sort of Express, to carry along this carbon to the consumers; that it is carried as the sand is carried in the rapid streams, and is consumed at the point of the burner, and from that we get our light. The facts which were brought forward in Mr. White's paper yesterday can hardly be disputed. They are the figures of our workings for a long time, and were simple facts, and pass for what they are worth. These facts seem to me to be very stubborn things, and I think they do not speak in very complimentary terms of the gas fraternity, Your honored and esteemed president, in his opening speech yesterday stated, and stated fruly, that a gas company was not a monopoly. In a legal sense *it is not*, but for all practical purposes *it is a monopoly*. No two gas companies can do business in the same place with profit. One or the other must yield, from the facts and surroundings of the case. Will you permit me, Mr. President, to make a statement, or give a reason, why the gas business must be a monopoly? It arises out of this fact, and I think this fact is universal, that the amount of capital required for a gas company in proportion to its business is so large, that no two companies can occupy the same field. Banks, insurance companies, and other business have the world for their field. They can throw enterprise into their business and extend it to any amount; a gas company cannot. Its business is fixed and it is local, and the amount of capital, compared with the amount of its business, makes it differ, it seems to me, from any class of business in the community. If Mr. A. T. Stewart, after he put a million of goods in his store, had to make a tramway to every customer he has, to send the goods home after they were sold, he would find that he had more money invested in his tramways than he had in the stock on hand; so that if you take the gas interest in the United States with the amount of business compared with the capital, it would not be over 40 per cent.; hence the profit on gas must be very large, in order to pay a fair return for the investment. Mr. Stewart, to carry on the illustration, may turn his stock eight or ten times a year, and if he makes one per cent. each time, he has made 10 per cent. We must make 25 per cent., in order to return the same profit, our yearly business being but two-fifths of our capital. And here is where the public do not understand, and will not understand this question, that the percentage of profit in gas manufacture must be very large, in order to give a fair compensation for the capital invested. This matter of monopoly is an important one, and your honored president will excuse me if I say, that while it is not a legal monopoly (as any one can make gas that pleases) it is practically a monopoly, and hence, unless the gas interest make some improvement—unless they afford a better light and a cheaper light—unless they advance as other departments of industry do, we shall certainly have just complaints against us from the community. I assert here, from what I know, assuming that our gas is a good one (and I have no doubt about that), hat there is a very great economy in getting the essential elements of which gas is made, upon the spot,

without paying this very large amount of expense in getting the coarse material. My own experience in the way of residual is, that those things do not amount to much in the end. They are said to be a profit. I don't think they are a very great income. They are often in the way, and I think that dividends upon residual are something as it was with the Morris Canal in New Jersey, which never paid but one dividend, and paid that by mowing the tow-path and selling the hay. I remember very well an anecdote related by a gentleman from Buffalo, who said that that while in England he met an Englishman, and the conversation turned on the city of Buffalo. The Englishman asserted that it was in Canada; the gentleman of Buffalo said, "No, I am an American citizen, and I know Buffalo is in the United States." The Englishman said, "Excuse me, I have no doubt you think so, but still you must be mistaken." The gentleman said, "I have lived in Buffalo for 25 years, and I know it is in the United States.," Tho Englishmen said, "Excuse me, I have no doubt you think so, but you must be mistaken." Now, when these facts come out day by day, and month after month, as they do now, it strikes me as strange for gentlemen to get up and say there is nothing in it, as a gentleman from Washington did last night.

The matter of the product of petroleum in this country has been brought up, and that is one that would attract the attention of all business men, and yet you would be surprised (I have not the figures) to see what a very small percentage of the amount of petroleum that is produced in this country, if all the gas companies were to use it, what a small percentage of that whole amount would be used; for it does not take a great deal of these oils to make 16,000 feet or a million feet of gas. We are getting about 130 feet of the average, of this high quality of gas, from one gallon of naphtha, day in and day out. This naphtha now is costing us 5½ cents on a year's contract, and it is easy for you, gentlemen, to state how much 1000 feet of the raw material will cost; if you add that we can make 100,000 feet a bench per day, with four or five men, you will come very near to the cost of naphtha gas. There is a limit, however, when naphtha will advance in price; that we understand very well. But situated as our works are, and as all the works should be situated, it takes only forty-eight hours to get back to coal again. If coal is too high we go back to naphtha.

There is another point in this which is a practical one, and that is, some difficulty which has been had in regard to strikes in gas houses. We had a severe one here in Brooklyn. Now, with us, if a strike should occur, we would take our engineer and clerk, and one man, and we will not leave our district in darkness. We can get along. We are independent as far as that is concerned, of these dangerous strikes. I think that is a very important matter. Then again, does it not strike all of you, gentlemen, that to go into a retort house and see the men stripped to the skin—thermometer 100 degrees—with wheel barrows, rakes, hot coke, water, and steam, working 24 hours, or 12 hours each, and then cipher down the very small product of gas to the man per day. It seems to be more like the toiling horses on the canal, than up to the advanced improvements in other department of manufacture. I think, with all due respect to the gas fraternity and the distinguished gentlemen who are connected with it, that with long experience they are rather to day the Marlboroughs in the field than the Napoleons. That there has been a later development of forces that has come to the surface, which must of necessity do away with old methods, while new ones, and more scientific and better systems must prevail. I was somewhat surprised last night at the remarks that our engineer made, in trying to urge this process on you. Gentlemen, I see no reason why he should do so. We are willing to give any information that we have; but to ask any of you, gentlemen, to adopt this method, seems to me entirely outside this association. I would not ask any gentleman here to visit our works for our sakes; we can go on as we are going on. If we are dissatisfied with it we can abandon it, and if we are satisfied with it we can keep on with it. We ask you to come for your own sakes, not for ours. I do not know but that we would rather have you go on in the old methods, and let us go on in ours. I can see no reduction in the price of gas in this city, so long as the present methods are followed.

I wish to say one word more. We feel very much gratified in having you with us. We hope to make your stay here as pleasant and agreeable as possible. We have a noble city, a noble park; and we have the piers of a bridge, up high enough to show that the foundation rests upon the imperishable solidity of greenbacks. We propose to annex New York to this city in about five years, also Jersey City and Westchester, then having a city that we can extend back 40 miles one way and 100 the other. We believe that Brooklyn will be the greatest city in the world when we get all these cities annexed. Nevertheless we have a half a million of population here, and we are very proud of our city; and I think also that it is better lighted than most cities in the Union, at least the southern portion of it. I am quite sure it is, and although there is some little evidence of darkness, yet that would not be visible to New York gentlemen; but we, who are accustomed to a better light, discover it very quickly.

Mr. Nettleton—I want to ask Mr. Libby whether he has made a comparative estimate of the cost of the plan to carry on the naphtha works and the coal works. And one other question—whether the meters are the same, or whether they have been interfered with by the use of naphtha gas?

Mr. Libby—I will answer these questions, especially in regard to the last one. As our engineer said, since we commenced, more than three years, if I am not mistaken, we have been experimenting and feeling our way along. While we were using the process in which atmospheric air was a part of the gas, there was more or less difficulty with the meters. Since we have thrown aside the atmospheric air we have had no difficulty. Since I have been in the gas business—which is about 15 years—our office has never been so quiet: we are having few complaints, our meters register properly, and there is no trouble in the district. There is another matter, the naphthaline or crystalline deposit which some of our neighbors suffer with, we have none of this at all. We used to be troubled with it. In regard to the point of expense of the naphtha works, it is impossible for me to answer that question, because we had to take the old works as we found them; but it is easy to see that six benches do not cost us so much as 18; and in our retort-house, which is 200 feet long, and 65 feet wide, you will see perhaps eight or ten men at work in this whole stretch of retorts, and our consumption is a little under 500,000 feet a day.

Mr. Littlehales–I must confess that I feel somewhat disappointed in reference to this subject. During the last six months, I venture to say, scarcely a day has passed but what I have thought over this question of oil *versus* coal; because I think there is no subject of so much importance—of such intense importance, I might say—to the gas world for two reasons—

First—We want to make more profit for ourselves.

Second—We want to be able to furnish gas at a less price.

Now, any method or process to enable us to do these two things will be the best thing that can possibly befall us. I think so far as the paper is concerned, it leaves us just as much in the dark as we were before. In fact I don't see that it gives us a single grain of information. We have been told in a general way that gas can be made for one-third less than coal-gas. That may mean at one-third less than his gas was made before. That may not mean that oil-gas can be made at one-third the cost in every place. What we want to know is the difference in cost of labor, in the cost of raw material, what it will cost at the holder. Secondly, is the outlay for capital counted, or how is that in proportion to what it cost for coal-gas. I must say the principal thing that drew me this long distance, was to hear what was said in reference to this oil question. I came with this view, with this object; wanting to make gas cheaper and pay greater dividends, and sell gas cheaper to all parties. If any one can show me a process by which I may accomplish this—I don't want to take it for nothing—I will recommend my directors to give $50,000 if it were necessary, to get hold of it, but I must know first of all, that it is better, that it is more advantageous. If we can get something for $50,000 that we can make $100,000 out of, I want to get it. Then $50,000 profit is made. We were told in a general way last night that it could be made for something like 80 cents a thousand feet, if I understood Captain White aright. I was told by a gentleman yesterday that he could make coal-gas for 75 cents a thousand feet. How is that? We want something reliable and something we can avail ourselves of, and act safely upon. Captain White seems to take shelter behind a screen, it appears to me. He said there were certain facts he thinks profitable to his company. I presume these processes are protected by patents; and if there be no objection that we know what they cost, then we shall know how we are getting on. If he can show us with a raw material at a certain price, then each of us can apply it to our own individual case, and we shall know what we are doing. But in the present position, it seems to me, that we are just as much in the dark as we were before the paper was read. Simple generalities have been presented. We want something more definite, with more information.

There are a few points I would like to ask definite information upon. The committee that was appointed last night, it seems to me would be equally unsatisfactory unless they can give us information on these points. One gentleman said they were not allowed to give us the facts and figures. Can this committee give them to us for publication? If Captain White was not allowed to give us the facts and and figures, the committee will not be allowed to do so either. If not, the committee will be a perfect farce. I would like to know about those points, and if we cannot have them answered now, I would like to have the committee receive special instruction to get all the information they can on those points. The first is: Captain White says it has only been partially adopted He said he would not recommend the entire abandonment of the coal process for that of oil. If he would not, why? If the thing is good up to a certain point, why is it not good all the way through. If it was only economical to make one-third of it, what is the reason? There is some reason, let us know what it is. Then we want to know the cost per thousand, subdivided into the cost per thousand for raw material, the cost per thousand for labor, the cost per thousand to the holders; then we want to know the total receipt of the consumer's meters—how much difference there is between the station-meter and the consumer's meters.

Then there is another thing. This same system, or as near as I can imagine, the same system of oil process, which, to my knowledge, has been tried in several cases, and in one case known to me, abandoned 15 years ago. They all seemed to carry out the same idea, getting as much gas as possible from the coal; decompose steam, and take the hydrogen and carbon and mix the two together. They all combined the same principle. I want to know, if this one is a success, wherein is the difference between this and all the others? I have not myself yet heard a single distinction pointed out between these two processes, or between this one and the 50 others that have gone before it. Captain White said last night, that it is a totally different thing from that used in Detroit. Let us know wherein the difference is. Surely these things are protected by patent, and if any company thinks proper to take these patents up, let them pay for them. Det us have some firm ground to tread on instead of these generalities. Let us have something more definite.

I may also say that this same thing has been agitated considerably in England lately. And a particular friend of my own, who has had some very considerable experience in it, gave me some facts and figures

in reference to it; and although the company at that time was professing to make large profits, it was really costing them more for the gas than they were selling the gas for. I have the figures of what the labor cost, and they were actually selling the gas for less than it was costing them, and yet the thing was a success.

A member—Did they make any dividends?

Mr. Littlehales—Yes, sir, they were paying dividends. I want to know wherein this process differs from the dozens that have gone before it. And another thing occurs to me, if this is such a success, and it can be made so cheaply, how is it that these other companies in Brooklyn do not make their own gas from it. I venture to say that if I was in the Brooklyn gas works, and I found that my neighbors could make gas so cheaply, if I didn't adopt their process, I would buy the gas from them. Surely there is some weak point, some screw loose somewhere. It would pay the gentlemen to lay a main across to New York and supply the whole of New York, if they can do something that nobody else can do. I cannot see how it is that your neighbors are all so blind. I want to adopt this if I can. I appreciate the force of the remark of the gentleman that just sat down, as to the severe strain upon the stokers; it is a severe strain, and I would very much like to see some plan by which it can be avoided; if I can do so by adopting a cheaper process, I see a great advantage in it by lessening the labor, for it all comes down to dollars and cents. How are we going to make gas cheaper, sell gas cheaper, and make more dividends? A gentleman who has been quoted to me as a great authority on this question, Mr. Edgerton—if he is present, I would like to ask him to give me information on the points I have alluded to.

Mr. Edgerton—I came prepared with a statement which will occupy ten minutes, and which will refer sufficiently I think to the naphtha-gas question, which has come up within the last four years. Four years ago I made a report upon it, and I will quote somewhat from that report.

ON PETROLEUM-GAS.

By Henry H. Edgerton, Superintendent of the Fort Wayne Gas-Light Company, Fort Wayne, Indiana.

Gentlemen: I wish to occupy your time for a few moments to present to your consideration the following facts, not unimportant to you, as the representatives of the gas manufacturing interest. You are all perfectly well acquainted with the details of your own working, in your various localities, in regard to cost of materials, yield, leakage, etc., and all the accounts in fact that lead you to that interesting figure, the profit per thousand feet of gas delivered to the consumer. Very few among you perhaps have tried any experiments, with a view to making useful to you that not inconsiderable competitor of gas—kerosene oil. We had nearly all of us made up our minds, and that too very firmly, that petroleum oil, in every shape, under any name or synonym, was our enemy under all circumstances. Four years ago, the prospect of a rather lively competition with this enemy induced me to reconnoitre, from a new point of view, the position. The conclusions arrived at were embodied in a report, published in the AMERICAN GAS-LIGHT JOURNAL, for April and May, 1871, which report is quite full on the subject.

The report and the conclusions arrived at caused the writer to be regarded as a decided renegade and traitor to the gas interest, by all the orthodox people who took the trouble to read the report. Very few of you, probably, read it through even if you commenced it. There seemed to be too much nonsense in it. However, I will not trouble you to go back to that, the main conclusion in a nutshsll was this—that the best way to deal with that dirty enemy, petroleum, was to use it up. That is—use it to the extent of establishing an equilibrium between petroleum and coal as a gas producer.

In that report, data were given by which I think any one of you could caluculate for himself, the point at which that equilibrium might be established—provided these data were received as true.

We of the gas interest generally, thought this use of petroleum to be too much encumbered by the genius of "patent rights." We are all human, and therefore when one finds himself, as he supposes, the possessor of a new and brilliant idea—the hope of an admiring posterity, duty to one's family and the laws of his country, induces one to rush in and take out a patent. It cannot however be contradicted that collectively we despise "patent rights"—we gas men particularly despise them—Some of us may have a remembrance of some other gas man paying for "Gengembre's patent non-freezing, non-evaporating, anti-corrosive, meter liquid," together with an extra meter bill the next year; or for "linseed oil cake purifying compound," one box warranted to last a year without change. This may bring us unpleasant reminiscences—let us pass on to main facts. The writer made sundry obstinate kicks at this "patent right" feature; but adopting the French motto—"against force of circumstances there can be no resistance," he succumbed. Now, representing the principle, construction and running of twenty two gas works using petroleum gas, both mixed with other gases as well as unmixed, he submits to you the following facts. Ordinary commercial naphtha of average 70° Beaume gravity, makes 80 cubic feet per gallon of 80 candle gas, is composed of a mixture of four gases, when properly made, contains no free hydrogen, no sulphuretted hydrogen, carbonic acid, or carbonic oxide.

It burns at the rate of one cubic foot per hour in a suitable burner, giving a light of 15 candles for one cubic foot; and, when free from any undecomposed vapor, the light is soft, brilliant, and perfectly free from smoke. The size of flame is 3½" spread, by 1½" high. One of the constituent gases is a non-illuminant or diluent—one slightly illuminant—the remaining two, 56 per cent. of the mixture, highly illuminant, of 1·272 specific gravity.

This gas is used unmixed in fourteen cities and towns in this country, at prices ranging from ten dollars to thirty-five dollars per actual thousand cubic feet. About two thousand consumers think this gas a commercial article, and pay for it on the above terms. Among its consumers are stores, hotels, private houses, street lamps, and last, but not least, wiskey shops, houses on the hill, houses in the hollows, with the same pressure. At present prices here, the commercial equivalent of two and one-half cents worth of benzine, made into gas, is four hundred cubic feet of 15 candle coal-gas.

Thus you will see that our dirty enemy petroleum is greatly grown in importance with its increased volume.

Some consider that even a good thing may be too strong for weak knees and stomachs, and therefore put water in it. Consequently no less than twenty-eight thousand five hundred customers of eight considerable companies are consuming this said-to-be uncommercial article, with more or less weakening coal gas, air, hydrogen, carbonic oxide and carbonic acid in it. Now they like it, seem to burn it, even where they have got a choice of a little more sulphur in theirs if they want it. Notwithstanding the combined efforts of these twenty-two gas companies, with their thirty thousand consumers, and all other ordinary drains on our arch enemy—he still grows on us, as the price goes down lower and lower.

In the ancient times when the big whales tried to beat out Boghead or even Newcastle coal with their oil, aided by those pine country people with their rosin, they totally failed.

Those of the ancient times remember well that fight and with pride too. Now whole counties are spouting oil in defiance, and it does look a little as if oil was raising right up on top of coal.

Then why not investigate and look the matter up fairly, squarely, and fully.

To those who have attended to it, are certain they know all about it, I humbly address myself, with a request to compare notes.

If wrong, I am willing to turn again, enter the orthodox fold, turn off that naphtha gas, and quit.

I used to be a good coal-gas man, and have an apparatus, very simple indeed, for unsealing the dip on hydraulic mains, and am ready to begin over again if necessary.

In regard to the price of the manufacture of this gas in different localities, and the cost of materials, there are certain fundamental data on which to base your calculations. The cost of labor for making you will have to ascertain comparatively, and make our estimate on it by visiting such works as are using it, and apply to the labor there the price that you are paying for labor. That I think embraces the foundation of the naphtha gas question at present.

Mr. Sutton—I, for one, would like to have information about this matter. I would like to know from Captain White about how he would advise to make gas: how much coal gas, how much hydrogen gas, and how much oil. I would like to know what it is, and so would other gentlemen. I want to know the practical part of it. I do not despise information from any source where I can get it.

Mr. Neal—Mr. President: You recollect at our meeting yesterday, there was a committee appointed on the subject of naphtha gas, of which I am the chairman. When are we expected to report?

The President—It would depend on the committee.

Mr. Neal—Not at this meeting?

The Presiden—It is not obligatory.

Mr. Neal—I have been looking at several works where naphtha is used, and I am entirely in the dark yet, and Ido not think we can make a report until the next semi-annual meeting. I would say as chairman of that committee, that we are not prepared to report—not so well prepared to report—not so well prepared as we were yesterday afternoon. We have been looking into the subject, and we are seeking for light, but we are all in darkness. I speak and act for other members of the committee. I think they are of the same opinion. We ask for further time. We ask permission to report at the next semi-annual meeting, six months hence.

The President—It is moved and seconded that the request be granted. Motion carried.

Mr. Littlehales—I beg that the committee be specially instructed to inquire as to the different cost, so we will have reliable data.

The President—If any one is desirous to draw the attention of the committee to any particular point, he had better submit it to the chairman of the committee in writing.

Mr. BEXTER—I had not intended to make any remarks at this time, but I feel, coming from a portion of the country but little represented here, that it is proper for me to say that I appreciate the attempt of the gentlemen to introduce to us a new process for the manufacture of gas.

While it may be unsatisfactory to us, to very many of us, yet we must feel under some obligation to these gentlemen for introducing this matter for our consideration. The novelty of it takes us almost by surprise, and we are unprepared for it. When we make comparisons between our process which we have followed for years, we cannot at first see the great advantage. These gentlemen say they can see it. The company which I represent is one that is doing to-day no larger business than it did in 1860, yet our business is much more profitable to the company by reason of the improvement of the manufacture of the gas and lessening its cost. We are anxious to become more economical in the manufacture, and reduce the cost to the company as well as to the consumer; and for that reason I am here with the hope of gaining valuable information for myself, for the company I represent, and for the general benefit of the fraternity in my section particularly. I simply have made these remarks so that I may not be understood as making any reflection upon the gentlemen who have preceded me, or those who represent an interest different from that which I represent. I am anxious to gain information and to make that information valuable to the interest I represent.

We have had some figures presented as to the quality and quantity of coals. I do not know that it is

desirable at this time to view them at all, as this matter will be presented by the committee at our next meeting. I had hoped if it were possible, that we might have a report at this meeting, and the comparsons as to the cost in various parts of the country might be brought before us. It is said that coal in New York cost $8·25 per ton. In some sections of the country it does not cost much more than half that amount;—the quality of the coal is perhaps different. The Virginia coal, which I am compelled to use, some 20 years ago, probably you will remember, was rated at about three to three and one-half feet to the pound. We now, under better processes, get from four to four and one-quarter, and in some cases four and one half feet to the pound. We consider that a great improvement but we want to do better, The cost of labor is another matter. Here in your great centre of activity, labor is costly, while in other portions of the country labor is comparatively cheap. As we met here for information, it is not only desirable that comparisons should be made in the city of Brooklyn, but in other portions of the country. In Virginia we have coal, but not oil. We would have to transport the oil from Philadelphia or Baltimore to the southern parts of the country where we have coal near at hand. so in some portions of the west, the comparison between the cost of coal and oil in those portions would be very different from that of the oil center, and far from the coal center. I hope the committee in making these investigations, and making their report, will take into consideration the various circumstances of the nearness to, and distance from, the various materials.

The process I will not speak of at all. I have had some little experience in these matters in years gone by. They have led me from one time to another to disappointment; and I hope the time is approaching when our disappointments are to end, and we will come to the determination of what is the best material, and that inexhaustible, to make gas of.

Mr. Neal—Professor Wurtz asks the indulgence of the Associat on. He asks that this subject may be laid on the table, to give him an opportunity to say what he has to say, as he has sickness in his family and he wishes to leave. I think that we should allow him that indulgence. Captain White says he wishes to speak about five minutes, then I would ask at the last of his remarks, the subject be laid on the table.

Mr. White –I will make that motion now. I waive any claim to refer to the paper at present, in favor of Prof. Wurtz.

The President—It is moved and seconded that the further discussion of this matter—naphtha gas—be laid on the table for the present. Carried.

Mr. McIlhenny—There is a gentlemen in the room who can give us some important information about how to make more gas out of a ton of coal.

The President—There is no subject before the Association now. The motion was that the Association is to hear Professor Wurtz. The Association is now prepared to hear him.

[Note by the Editor.—The Communication here referred to requires illustration by cuts, which are in process of preparation, and it must therefore go over to a subsequent issue.]

Mr. White—I move a vote of thanks be tendered to Professor Wurtz for his extremely interesting lecture, and the experiments which he has presented to the Association this morning. Carried.

The President then addressed Professor Wurtz, conveying to him the thanks of the American Gas-Light Association.

It was moved that the subject which was laid upon the table be resumed. Carried.

Mr. White—There is a paper to be read upon the subject of Purification. I think it would be better to have that read.

The President—The association has decided to take up the other matter.

Mr. Cathels—I simply want to ask a question of the Citizens Company, if I understood it correctly, that five men were engaged in the manufacture of 300,000 feet of gas, or ten men, five in the day and five at night?

Mr. Libby replied by saying it was four men.

Mr. White—As my paper seems to have been the source whence all this discussion has sprung, I would like to call the attention of the association to some remarks made in that paper. I spoke in the opening of the paper, of the fact that I knew I should be traveling upon a dangerous and much disputed ground, in entering at all upon the discussion of the subject. I farther say in the paper, that we have no desire to proselyte any company in the country. I was simply relating in that paper the result of the experiments made at our works, and the general benefit we had derived therefrom. There are some points, however, which have been raised, and some questions asked here this morning, which I feel it is due to myself and the association to reply to. I did not, as I stated in my paper, give you actual figures of the results at our works. I did not, for two reasons—one that they might be brought out in discussion, and another that it would be almost impossible for me, within the limits of that paper, and of your patience, to go into any extended and tabulated defense of the subject of the paper I made the bare assertion in that paper, that my company were manufacturing gas cheaper and better than they ever made it under the old working, I claim that we put the gas into the holders as I said, at about one-third less cost than under the old process, in round numbers; probably it will not be within a cent or two of exactly one-third, but it is in that neighborhood. The absolute figures are withheld, for the simple reason that I did not wish to make the fact a public one. Among ourselves I am willing to give any facts to be used, to convince the gentlemen actually interested in this matter, any facts that are necessary for such information. We would cordially extend to them, upon a visit to our works, or here in discussion among ourselves. The point that Mr. Littlehales makes is a good one, upon the question of labor and the general saving, and it is one that I feel perfectly at liberty to reply to. It seems to me, if I can come here upon my authority as engineer of my company, and upon my known reputation among you, as I think, as a gentleman of probity, and assert that our pay roll, an indisputable thing, demonstrates the fact thot we have reduced the labor in our works fully one-half—if I say to you, gentlemen, that instead of running 20 or 25 or 30 benches of five retorts each, we made all the gas we want, in the press of last winter, with ten benches of four retorts, and two benches of naphtha and two of water gas, making altogether fourteen benches, our daily consumption being that winter in the neighborhood of 1,000,000 feet of gas. Last winter it was a little less than 800,000, but the gas was all made from fourteen benches It is not necessary for me to say to those practically engaged in gas making, how many men it takes to run fourteen benches. You know that as well as I do. In making the assertion that we make gas for 80 cents a thousand feet, and put it in the holder, I know that strikes a great many gentlemen as not a remarkable exhibit, but the gentlemen must take into consideration the facts under which we work; that in the large cities where labor is high, we cannot compete with you who are differently situated on the question of labor; but take your own price of coal—take the cost of naphtha—reduce your labor one half—reduce the quantity of coal you use half or nearly so, and then see where you will reach in your figures. I cannot of course stand here to-day and say we make gas for such and such a price, and have a gentleman rise up and say we can do so and so in our country without the naphtha gas. That gentleman is talking of labor that may only cost him $2.25 a day, and coal that may cost him $4.50 in his retort house. The remarks I made last night were based upon the past year's business, when labor cost $3.50 and coal cost $8.25, and I am now speaking of a past and closed year's work. If this thing was fallacious, I certainly desire its fallacy pointed out. If I can deceive a body of stockholders composed of prominent business men, and a board of directors, than whom no shrewder business men are engaged in our profession, and if I can deceive my much respected and very able president, I am a sadly underrated man outside. If I have gone on in my works for twenty months, and studiously and successfully deceived my people, and yet paid them larger dividends than they ever got before, I think I am a very successful and underpaid gas engineer. Money is the test of this thing. We have gone on, month after month, at this business. We have lessened our expenses of working —have paid our regular dividends, paid our current indebtedness, and owe no man anything. Could this be done in working a non-paying concern? I venture to think not; the money must be earned before it can be expended or divided. Touching upon some points of Mr. Littlehales, as to why I do not describe fully the method we employ in manufacturing, I beg to call his attention to my description in my paper of this very matter; I cannot be more explicit so will notnow try. As to the fact that failure has followed failure, and scheme followed scheme to a common result it is neither here nor there. I admitted that all this was true—that men had crossed and re-crossed this ground until it was a confusion worse confounded of patented failures; but claim that the richest fruits of invention and thought, like those of nature, come from ground vivified by the very process of decay. Again, I am unable to say why the other companies of Brooklyn and New York do not follow us into this new field any more than I can account for some of Mr. Littlehale's own views. This I do know, truly, it is a knowledge we all show, that men will differ upon facts as well as upon theories, no ten men seeming to see a thing alike from any one point. When gentlemen will prove that gas-lighting is a failure, because Sir Humphrey Davy said it was impossible to light London, and that the railroad is not superior to the canal boat for rapid transit, because many good and thoughful people once believed otherwise, or explain why all changes meet just this species of attack in their outset, I may be sufficiently enlightened to tell why other companies do not join this movement, but I can cipher up their loss in waiting for some other to ford the stream.

I did not claim nor do I claim that these workings are perfect, or that we had reached the limits of this investigation. I was very glad to meet Mr Edgerton this morning and hear him say what he did. I feel with him, that we have just entered into a field, in which I frankly believe the next great change in our process of manufacture will occur. It does seem to me, that without giving the gentlemen engaged in our business the absolute detail of fact here, these assertions, for they cannot be disputed, ought in a measure to suffice. If it is necessary, I have the exact details of every portion of our manufacture and can give them. There is no intention of deceiving you; there is no desire on my part to lead you into this thing. I should not gain one penny if every gentleman in the room purchased the right to manufacture. It is of no value to me, but as a member of the association, and on your invitation, I have written a paper on the subject, and I have done it in that spirit of frankness in which I expect to be met by you all, and in which I expect to be dealt with here. If, in closing, I have neglected to meet all the questions asked, it has been from no desire to screen myself, as has been charged, behind glittering generalities. I made no notes of the argument of others, so will answer any further questions, if the desire still exists r your patience lasts.

[To be concluded.]

"Vaseline."—The new product of petroleum to which this name has been given, promises to come into use as a vehicle for various emollient preparations, for which it appears to possess some peculiar advantages. It is a solid, semi-transparent jelly, neutral, and free from taste or odor, and it is said to undergo no change by keeping. It becomes liquid at a temperature of 93° Fah. The manufacturers state that it is prepared simply by the evaporation of crude petroleum, and filtering the residue through animal charcoal.—*Iron.*

[It strikes us that this stuff, for which this absurd neonym has been invented, cannot be anything but impure paraffine.—Editor.]

Chemical Repertory.

No. 122.—December 2, 1874.

EDITOR—HENRY WURTZ.

CHEMICAL EXCERPTS.

1285. Chicago Water.—Chicago is supplied with water by means of a tunnel two miles long carried out to the middle of Lake Michigan. The capacity of this tunnel is stated to be 57,000,000 gallons per day, and yet Chicago commenced in 1872 building another tunnel (nearly twice as large as the first), which will it is expected be ready for use at the commencement of 1875. Chicago will thus next year have water-supply arrangements adapted for a population of about 5,000,000.

1286. Street Watering.—An estimate founded on private inquiry, tells us that the cost for labor in watering the streets of London averages about £135,000 per annum, the cost of water being additional. It is contended that the whole of this watering can be accomplished in a far more effectual and advantageous manner, by a system of permanently laid pipes, for an expenditure of less than £3,000 per annum in labor; while the interest upon the plans necessary for the purpose would not exceed £20,000, making the total yearly cost of watering (exclusive of the water itself) only £23,000 instead of £135,000.—*Builder.*

1287. Paraffinic Acid.—Submitted to the action of fuming nitric acid at 47° B, or to that of a mixture of sulphuric acid and fuming nitric acid, paraffine oxidizes and becomes transformed into an oily liquid, of a light yellowish green color, which M. Champion has named paraffinic acid, and to which he ascribes the formula—$C^{26}H^{26}N\ O^{10}$.

The composition of the paraffinic ecid permits paraffine to be certainly designated by the formula—$C^{48}H^{50}$. It may therefore be regarded as a clearly defined compound, and not as a mixture of different carburets of hydrogen.—*Sci. Am.*

1288. British Patent.—Manufacture of anthracene. Ernest Friedrich Richard Lucas, consulting chemist, Coatham, Redcar, York. January 24, 1874. —Under this invention anthracene is obtained from the heavy coal-tar oils which distill at from 260° to 360° Celsius, by passing the same, or the vapors thereof, through pipes or retorts previously raised to a red heat. The heated surface is increased by filling the pipes or retorts with pieces of fire-brick. The oil obtained by this operation is submitted to distillation and the distillate which passes over after 360° Celsius, is collected separately, cooled and pressed, the press cake thereby obtained being crude anthracene. The liquid oil resulting from this distillation is again passed through red hot pipes or retorts, and another portion of anthracene is obtained therefrom.

1289. Paper-Manufacture and Water-Supply.—In our discussions of the water-supply of the New Jersey towns, we have urged abundance and purity as conducing to establishment of important manufactures, among them paper:

The *New York World* says of New York:

Comparatively little of the finer grades of paper are manufactured in this city, and the manufacture of printing paper, which employed nearly 700 persons ten years ago, has been steadily diminishing year by year and going where the first requisite of the manufacture, an abundant supply of water, is more easily obtained.

1200. Thin Iron.—The *Ironton Journal* says:

A small sheet of iron, three inches wide by five inches long, was laid upon our table lately, which weighs exactly nineteen grains. It comes from the Iron and Steel Company, and is said to be the thinnest iron ever made. Some time ago the Wheeling papers boasted that a mill or mills of that place had rolled iron so thin that a piece three by five weighed only forty grains. The experiment was tested in the Iron and Steel Company's mills the other day by the Superintendent, Mr. Thomas Johns, with the above result. If the Wheeling or any other mills in this country can beat this we should like to hear from them. Mr. Johns thinks another experiment will show even better results.

1291. The Largest Ventilator in the World.—The *Monetary and Mining Gazette* says the largest mine ventilator in the world is a guibal fan 45 feet in diameter, and 12 feet face at the Unsworth Colliery near Newcastle-on-Tyne. That journal says:

This fan runs about forty-five revolutions per minute, and is said to circulate 200,000 to 250,000 cubic feet of air per minute. It is driven by two first motion engines, 36 inch diameter cylinders, 8 feet stroke. The upcast shaft is 10 feet diameter, and 600 feet deep. The workings in three seams are ventilated through it. The output of the Unsworth Colliery is about 1,500 tons per day. The mines are very extensive. All the underground haulage is performed by machinery; two of the three seams are worked on the long wall plain.

1292. New Illuminator.—Mr. J. H. Johnson (for E. A. Lammarre, of Paris) has patented some improvements in combustible compositions, and in their mode of application for signalling and illuminating purposes. This invention relates to certain combustible compositions suitable for buring as signals or for illuminating purposes, whereby a brilliancy, duration, and intensity are imparted to what are known as Bengal lights, torches for signalling purposes and pyrotechnic displays not hitherto attainable. Also to certain peculiar enveiopes or cases for the said compositions when used as torches. Whatever may be the color of the flame decided upon, the basis of the composition, according to this invention, consists of boiled linseed oil and a suitable proportion of non drying oil, such, for example, as olive oil or colza oil, combined with a chlorate or coloring matter.—*Lond. Mining Journal.*

1293. Village Water-Supply.—Few people outside of our villages are aware how increasingly difficult is the question of pure water-supply. In most of our small towns the wells are adjoining cesspools and stables, and receive more or less of the constant drainage of the latter. A chemical analysis was made during the past year of the water from the wells of one of our most thriving towns—Ithaca—and most of them were found infected with poisonous animal matter. One house, whose well showed the worst composition had been afflicted with terrible diseases. It is well-known to physicians that nothing conveys typhoid or cholera like drinking-water which is infected with cesspool drainage.—*N. Y. Times.*

1294. American Iron.—There appears to be no question now among engineers, says the New York *Sun*, that American iron is superior, in quality and strength, to English. Comparisons as to the relative tensility of Lake Superior and English iron—made by the use of the Kiehle testing machine, which is that employed by our Government for all purposes of this kind—show the following results:

A one and one-quarter inch chain of Lake Superior ron withstood a draft of 101,750 pounds while a chain of English iron of the same size broke at 76,500 lbs.; a five-eighths inch chain, American, broke at 19,000; a three-fourths-inch American at 38,000 and an English at 26,000; a one-half inch American at 15,825, and an English at 8,506; a seven-sixteenths inch American at 10,250, and and an English at 5,760.

1295.—Breathing Rarified Air.—M. Bert, from his researches of the effects upon life of compressed and rarefied air, suggests a simple device for use by travellers ascending high mountains or by æronauts. It consists of a Y tube, one arm of which is connected with an oxygen bag made of inelastic material. The other arm is open to the atmosphere; and in a rounded portion inside, near its junction with the balance of the device, is a small balloon of elastic material filled with ordinary air. The mouth is applied to the end of the straight part of the Y. As the elevation of the person using the apparatus increases, the ball in the tube expands, owing to the decreased air pressure, and hence closes the orifice leading to the surrounding atmosphere. The supply for the lungs is therefore drawn in a greater proportion from the oxygen receiver, enabling the functions of respiration to continue without uneasiness.—*Sci. Am.*

1296. Effect of Hydrogen on Iron.—Iron or steel wire which has been acted on superficially by sulphuric acid is usually found to be altered in its properties. Its weight is increased, its tenacity is injured, so that though originally soft and flexible, it easily breaks; and when a freshly broken end is moistened by the tongue it effervesces as if acted on by a mineral acid. These effects after a time disappear. Prof. Osborne Reynolds, of Manchester, has ascertained that they are owing to the absorption of hydrogen generated during the chemical reaction which takes place when the wire is immersed in the acid. He found that, if an iron tube, closed at one end, be immersed in a dilute solution of sulphuric acid, hydrogen passes through the walls of the tube into the interior, and may be collected by attaching an india rubber tube to the open end of the iron one, and passing it under a gas-holder. Prof. Reynolds concludes that, whenever iron undergoes oxidation under water, it becomes saturated with hydrogen, and thus loses tenacity—an important consideaation in the case of steam boilers or iron ships.—*President Barnard.*

1297. The Great Collapse.—The extent of the panic of September, 1873, now still raging, is graphically portrayed in the compared exhibits of commercial statistics for 1872 and 1873. The amount of liabilities of the men who failed in the former year is estimated at $121,000,000, and for the latter $280,000,000. Five thousand one hundred and eighty-three persons, firms and corporations contributed to the financial distress of 1873. Of these failures about one-eighth of the whole occurred in New York City, and involved the loss of $92,500,000, or about one-third of the whole amount of the losses. This disproportion indicates at the same time, the immense business of that city and the amount of wild and reckless speculation.—*Exchange.*

1298. British Patent.—F. C. Hills, Chemical Works, Deptford, Kent.—Purification of gas and gas-liquor.—This invention relates to the patent Number 1369 (A. D. 1868). The crude gas liquor is run either direct or through a scrubber to a still in which the liquor is kept at a temperature of about 180°, whereby carbonic acid, sulphuretted hydrogen, and ammonia are driven off. These products pass from the still up through the scrubber, the greater part of the ammonia being condensed and carried back to the still by the descending gas liquor when the liquor is passed through the scrubber, while the sulphuretted hydrogen and carbonic acid gases escape at the upper part of the scrubber with a little ammonia, which latter may be taken up by water, acid, or other suitable ugent. The carbonic acid and sulphuretted hydrogen may be passed through oxide of iron to collect the sulphur. The crude gas liquor before being run into the still may be kept for some time at a temperature of about from 160° to 170°, and the sulphuretted hydrogen then given off may be used for making sulphide of ammonium. The gas liquor treated as described may be used for purifying gas. Crude gas liquor is made to combine with more of the carbonic acid combined with gas, and thus to free the gas from such acid by passing the gas direct from the hydraulic main at a temperature of about 160° into the scrubber.

Correspondence.

[Correspondents, in all cases, should sign their communications with their names and address in full—not necessarily for publication, but as a guarantee of good faith.—Ed.

"On Naphtha—Its Economy and Value as a Gas Producer."

Paper read before the meeting of the American Gas-Light Association, October 21st, 1874. By W. Henry White. Engineer Citizens Gas-Light Company.

New York, November 25, 1874.

Mr. Editor: The paper of Capt. White, and the discussion which ensued, as published in your Journal of the 16th Inst., were well calculated to excite a deep interest, on the part of the members of the associat-on then present, in the "water gas" process which has been so long and so successfully in operation by the Citizens Gas-Light Company of Brooklyn.

That company secured the right, and introduced the "Gwynne-Harris hydrocarbon process" into their works over eighteen months since, and the results, as explained by Capt. White, ought to satisfy every gas manufacturer that it is a great folly and waste to ignore this improvement, or to deem it a *mere experiment*.

It ought, however, to be understood that the Citizens Gas-Light Company of Brooklyn, previous to adopting our hydrocarbon process, had the "Gale and Rand" process, requiring extensive and costly machinery and apparatus, which we do not consider at all necessary, or even desirable, for the full and successful working of the "Gwynne-Harris hydrocarbon process." This is fully proved in the works of the Citizens Gas-Light Co., of Newark, N. J.

There they also had both the "Gale and Rand" and the "Olney" processes in operation. Bnt when they introduced our hydrocarbon process, they cut off all that cumbrous and expensive machinery and put in our process, in its most simple and perfect form. They have been running it since the first day or June last, and I think I hazard nothing in saying that their books will show a considerable increase of profit, above that stated by Capt. White as made by his company, and which so surprised the members present.

The Citizens Company of Newark first started with two hydrogen benches and one naphtha bench of three double retorts each. They run the naphtha with the hydrogen into the naphtha retorts together, and a beautiful and permanent gas was thus formed of over 20 candles power, without any *cinders* from burned carbons.

Subsequently, J. Pearson Gill, Esq., the able and intelligent engineer of that company, finding it necessary to make sufficient coke to run their works, set two coal benches under our process, and into the bituminous retorts in each coal bench he ran the hydrogen from one retort in each hydrogen bench, thus taking up the excess of carbon in the bituminous coals, and making thereby a satisfactory profit.

The hydrogen and naphtha gas is made so rich that when mingled with the coal gas of inferior quality, the whole product of their works averages 18 or 19 candle gas. Their hydrogen and naphtha benches are wholly separate and distinct from their coal benches, having separate mains, exhausters, meters, and photometers; so that they know daily how much gas is made from each, and the quality of the same. They have thus made hydrogen and naphtha gas richer than a 25 candle power photometer would indicate, and yet there was no smoke whatever, nor any smell of kerosene in it, so completely does hydrogen absorb it, and aid in converting the naphtha into perfect gas.

The Citizens Gas Company of Newark have fifty-four miles of pipes, and they send their gas to South Orange, a distance of 7½ miles from their works to the point of distribution. They fill their Orange holder before 9 o'clock in the morning, and the gas stands in the holder until evening, when it is sent that long distance to its point of distribution; and yet it loses scarcely anything in quantity or quality. Since the first day of June last they have made from the two hydrogen benches and one naphtha bench, about 14,000,000 feet of gas. notwithstanding that for many weeks they have turned about one-third of their hydrogen into their coal benches, and thus passed it through their coal gas meter, and therefore it is not included in their hydrogen and naphtha gas record.

To make an 18 candle gas of hydrogen requires 2½ to 3 gallons of naphtha to 1000 cubic feet of the perfected gas. This is "true as preaching" and cannot be gainsaid.

I find in the discussion referred to, the following:

"Mr. Neal—If the company that I represent were to use that process, would not the cost of manufacture be somewhat greater for the cost of the patent?

"Mr. White—The cost of the patents would, of course, enter in. The arrangements made with other companies have been such, that the cost of the patent has not been great or oppressive in any manner. The parties owning the patent right have been very liberal in their arrangements with gas companies desiring to use it."

This is so honorable, just, and true an expression on the part of Capt. White, in respect to the company I represent (who are the owners of the patents for this process), that not having been then present, I now thank him for it, and say to all established gas companies, that we are ready to deal liberally with those who desire our process.

Mr. McIlhenny, in the discussion above alluded to, as published, very justly said, "You may make oil gas on a small scale, and make it very successfully, but when you make seven or eight millions of feet a day; when you commence to light a city with these immense praportions, you have to dilute it with hydrogen or air; such hydrogen as you have to make out of steam." This too is "true as preaching," and cannot be gainsaid. But we repudiate *air* altogether. We say it has no business in gas in any shape, *hot* or *cold*, whatever. Hydrogen is the only proper diluent, and there is no other process by which steam can be converted into a fixed and permanent gas so certainly and cheaply as by our process. The Citizens Gas Company of Newark, with their two hydrogen benches and one naphtha bench made 100,000 feet a day, and one day 102,000 feet, and if their consumption required it in addition to their coal gas, I think they might average that quantity per day. I am not at liberty to publish their secrets, but if any one will confidentially inquire of Mr. Gill, I am certain that he will give even more surprising information as to "the cost of gas," than that furnished by Capt. White. Quoting again from your published report, Mr. McIlhenny said, "And some of them do not make hydrogen, although they think they do."

This is also true. I could tell you of a company who, without our permission, used our old patented cupola to make hydrogen. We had long since advanced far beyond that in our improvements. Still it was our property, and the use of it was simply *poaching*. But so ignorant were they as to what they were producing, that the person in charge attempted to light it, *but it would not burn*, and after trying several times he remarked, "*I guess it is too moist.*" That company is *defunct*. Others have attempted to use our "clay superheaters," and other parts of our patented apparatus, and all who attempted to decompose superheated steam by passing it, in finely divided jets, *through* incandescent carbons infringe upon our patents, and will hear from us in due time. "But," said Mr. McIlhenny, "no gas company has a right to go inta these preliminaries until they know that they are a perfect success. They must not trifle with the interests and feelings of the consumers."

If no gas companies will adopt an improvement until they know it is "a perfect success," how shall its success ever be proved; or how many companies must first go into it, and how many millions of feet of gas be made, before its perfect success will be considered as proved? Again, have all coal gas companies been so tender of "the interests and feelings of the consumers," that he has never heard "a howl in the community" on account of the miserable gas furnished, and the exorbitant prices charged?

I can tell him of an old coal gas company in a neighboring city, where the "howl in the community" has been such that one would think "that every gas man would try to shun it. But they did not. They might have secured a right to use our process at a moderate price, and thus have given to their consumers a far better gas, at a less price, and at a greater profit to themselves. But they were *too penurious*. And what is the consequence? A new company has been formed, and have secured our process, and are building their works, and will furnish to the people a better gas than they have ever seen there, at 25 per cent. less cost than they have for years been paying for a miserably poor coal gas. The city authorities have given the new company a contract for ten years, for lighting the street lamps and public buildings, and two-thirds of the consumers have signed written agreements to take all their gas of the new company at the agreed paying prices.

A merchant of this city, of high character and standing, after our process had been used nearly three years, in a gas company in the country, in which he was a director and large stockholder, tried to induce a company in this city, in which he was also a director and stockholder, to put our process into their works, and assured them of his personal knowledge of its great value and success. And yet an officer of the company said they were making such good gas, they did not dare to try any experiment, for fear of giving dissatisfaction to their customers; while at the same time there was not a company in this city, or hardly any where else, so roundly and constantly denounced by their consumers, for the villainous gas they furnished.

Now, why is this so! Do gas men deceive themselves? Or are they not competent to judge and determine between a genuine, valuable improvement, and a humbug? What I have stated about our process I know to be facts, and can prove them to the satisfaction of any unprejudiced, open-minded gas man.

H. P. Allen,
President National Coal Gas Co.,
4 Warren street, N. Y.

A Correction.

Office of the Am. Gas-Light Association,
117 Broadway, N. Y. City.

Editor American Gas-Light Journal—

Dear Sir: In your issue of the 16th inst you give a list of the officers of the American Gas-Light Association, elected at the last annual meeting of the association, held in Brooklyn on the 23d of last month.

Two errors occur in the list as published.

The name of Mr. Steele of Buffalo, vice-president should be Oliver G., instead of Oscar G., and the name of General Leavenworth, of Syracuse, should be Elias W., and not Elias H. Both of these gentlemen have been long and honorably known in business (each over forty years). Justice to them requires that their correct names should be used, so that they may continue to receive and enjoy all the honors which friends and acquaintance cheerfully accord to them, for so faithful and just performance of official duties in the respective gas companies to which they belong, and as citizens of the community in which they dwell.

Yours, etc.,
Charles Nettleton,
Secretary American Gas Light Association.

[To Mr. Nettleton's corrections we have another to add In the roll of members in attendance, in our issue of November 2, "Thos. C. Carroll" of Yonkers, should of course be Thos. C. Cornell.—Ed.]

Sheet Iron Gas Pipes and their Power of Resistance.

The Paris Gas Company have lately laid down a main one metre (39.4 inches) in diameter and one kilometre (3,281 feet) in length, from St. Maude to the Place du Trone. Hitherto sheet iron pipes covered with bitumsn have not been applied to mains of that dimension, and it was important to ascertain how such pipes of a moderate thickness would answer be-

neath the public roads, where they would be submitted to the permanent and accidental pressure tending constantly to produce deformity.

The company had already adopted sheet iron pipes of 70 centimetres diameter without any important deformity being produced, and it was only necessary to submit the metre pipes ta similar pressure to ascertain what effect it would produce, all theoretical calculation being deemed untrustworthy. A comparative trial was therefore made with the aid of an apparatus planned for the special purpose. A pipe of 70 centimetres diameter of the ordinary thickness of four millimetres, and a pipe of one metre and five millimetres thick were laid in the ground in the mode adopted for the mains in Paris, the trenches having been dug in such a way that there was a space of a quarter of a metre between each side of the tube and that of the trench, and that the filling in above each pipe should be one metre in depth. The pipes in ordinary use are four metres in length, but in order to spread the weight over a larger surface, pipes six metres long were adopted for the experiment, and one end of each was left open to allow of access to the interior.

The trial was made by placing on the soil above the pipes pigs of lead from four up to twenty tons weight, which were supported on a platform composed of timber, and having a surface of eight square metres. This platform was laid upon two pieces of timber, each 50 centimetres long and 25 centimetres wide, and placed one metre 80 centimetres apart, which represent the tires of the two wheels of one of the axles of a locomotive of forty tons. The apparatus for the indication of the deformities produced consisted of a circular disc of sheet iron with nine radial rods, each supported by two small guides screwed to the disc and provided with a spiral spring which kept its outer end pressed against the inner surface of the pipe. The guides of the rods were each provided with a set screw to hold the latter in place while the apparatus was being placed in the pipe. The only object af the rods at the lower part of the disc was to maintain the center of the latter in the axis of the pipe, and when the apparatus was in place both the guides of these lower rods were screwed firmly to the disc. Thus any alteration in the verticsl diameter was measured from the center. In the center of the disc was an opening 20 centimetres in diameter, fitted with a piece of iron covered with leather, which carried a circular piece of paper. Each iron rod on the upper part of the disc was fitted with a pointer held in a small tube by a spring and provided with a copper button. When the apparatus was in its place a finger was pressed on each button, and the position indicated by pricking through the paper, the leather behind preventing the point of the needle being turned. When a load was laid on the platform above their position, the pointers were again pricked through the paper, and the difference between the two marks showed the amount of difficulty produced. The results obtained were then transferred to a diagram of the same section as the pipe itself.

By comparison of the diagrams obtained, it was found that with a load of twenty tons pressing on the pipes for 130 hours the one metre pipe had given way vertically to the extent of 0·0285 metre, or 2·85 per cent., and the smaller pipe 0·031 metre, or 4·30 per cent. The conclusion was that a pipe one metre in diameter and five millimetres thick offered greater resistance than a pipe 70 centimetres in diameter and four millimetres in thickness, which had alredgy proved itself satisfactory in practice. It was found by further experiments that when a pipe had once been deformed by a heavy load, it only recovered itself to the extent of a few millimetres when the load was removed. After these experiments a main one metre in diameter was laid from the gas works at Saint Maude to the Place du Trone, and as the joints were made they were tried with compressed air under a pressure of 70 millimetres of the mercury manometer, the pipes themselves having been previously tested under a pressure of five atmospheres. These trials revealed a few defects which were easily repaired. Since that time the main in question has been in use constantly, without exhibiting anything contrary to the results of experiments above recounted.—*Iron Age.*

Gems and Generalities.

Hoboken claims the proud pre-eminence of being the unhealthiest town in New Jersey.— *World.*

Advice gratis for the typhoid districts: Drink filtered rain water and let well alone.

The plague is still spreading in Northern Africa, and has appeared in the neighborhood of Mecca.

The Dodge mine at Lisbon, N. H., produced the other day a nugget of gold valued at $400. This seems a dodge worth knowing.

There were eighty-five fatal cases of diphtheria in New York the week ending October 24, against seventy five the week before

[These items are now old, having been crowded out. Since this, the deathis from this disease have nearly doubled.]

The water in Hope Creek, Salem Co., N. J., became poisoned in some way lately, and the fish and crabs died by thousands. The shores of the stream were lined with them, and no one was able to explain the cause.

The fishermen in New York bay, near Communipaw, are complaioing that fishing with nitro-glycerine blasts, which bursts the air-bladder and kills the fish, making them float, is driving all the fish away.

Mayor Hunter, of Brooklyn, on October 6th, denounced the Park Commission and Board of City Works for their extravagance in spending the people's money.

The following are the amounts of coal mined in Austria during 1872 and 1873: Bituminous in 1873, 103,266,170 cwt.; in 1872, 86,123,267 cwt. Anthracite in 1872, 80,123,472 cwt.; in 1873, 74,056,139 cwt.

A Boston paper ignoring the conflagration of the Hub, maliciously suggests that as the West is termed "the Switzerland of America," Chicago should be called "the American Berne."

Ashfield, Mass., resignedly reports that "typhoid tever in a severe form prevails as an epidemic;" wherein Ashfield shows itself behind the age, and the age it is behind is drain-age.

At Sheffield, Eng., people drown themselves in the reservoir from which water is drawn for public use, and in the time of one keeper 90 bodies have been found in that reservoir.

A provincial gentleman, who had heard much of the adulterations practised in large cities, recently had his suspicions confirmed by seeing a man watering the gas, by pouring a liquid into the meter.

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THE AMERICAN GAS-LIGHT JOURNAL AND CHEMICAL REPERTORY.
Publishing Office, No. 42 Pine Street.

PUBLISHED ON THE 2ND AND 16TH OF EACH MONTH
At No. 42 Pine Street, New York.

A. M. CALLENDER & CO.,
PROPRIETORS.
EDITOR---PROF. HENRY WURTZ.
Editor's Private Office, 12 Hudson Terrace, Hoboken, N. J.
(Immediately fronting the Ferry Houses.)

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NEW YORK—AMERICAN NEWS COMPANY, 119 and 121 Nassau St
BOSTON—S. M. PETTENGILL & Co., 6 State Street.
PHILADELPHIA—COE, WETHERILL & Co., Ledger Buildings, Phila.
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☞ All communications to be addressed to **"The Proprietors,"** No. 42 Pine Street, Room 18, New York.

WEDNESDAY, DECEMBER 2, 1874.

WISHING TO MAKE THIS JOURNAL an organ of intelligent discussion to those of our readers who may wish to gain or give information on the subjects to which its columns are devoted, the publishers solicit letters from all among them who make the study of these subjects a pleasure, or a profession.

Subscribers would confer a favor upon us by remitting *CHECKS*, or *POST OFFICE MONEY ORDERS*, as we are frequent losers where money is enclosed in letters.

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AN EDITORIAL TRIP TO NEW HAVEN.

On a recent occasion of business in the pleasant City of Elms, we were lucky enough to be able to make a quite satisfactory visit to the gas works. Our observations so interested us that we want the readers of the Journal to participate in our satisfaction. Mr. Cox, the genial and skilful Superintendent, threw open everything, apparatus, books, and past records, to our free and critical examination.

Besides the advantage this company has, in the practical skill of their Superintendent, we believe that it is not too much for us to say, it is also peculiarly and exceptionally fortunate in another way, inasmuch as there is one man in the board of directors who from his long familiarity, both scientific and practical, with gas subjects, should be better able than most directors in gas companies to give safe and profitable advice; and it is evident from the progress made since this distinguished chemist has been permitted to guide to some important degree the policy of the company, how great that advance has been which makes the present state of the works contrast so strongly with their past condition. We learn that the advantages of this are evident not only in the present value of this property and its earnings for its owners, but also in a greatly increased capacity to serve the public.

We were some years since somewhat familiar with the New Haven works at the time (1868–69) when engaged there with Prof. Silliman in the investigations on water-gas lately published in detail in these columns. At that time these were not model works. But we learn that not long subsequent to the date named there was a change of administration. The former superintendent (Cox) remained in charge, but a new life was infused into the entire management. On our late visit we were surprised and gratified to see the improvement manifest on every hand. The new offices of the company in Crown street are in a substantial and well planned building, erected by the gas company, and afford also offices for the water company. In this building there is even a well-furnished gas-laboratory where not only daily photometric but chemical examinations are made by the zealous and intelligent secretary, Mr. G. Morse, Jr.; a condition of things which reflects high credit alike on the company and on himself, and which all our larger companies should emulate.

The three holders of this company were found compactly arranged in a position about one-third of a mile from the works, and all covered by substantial brick round houses with conical roofs; together of about 800,000 cubic feet capacity. The holder number three, built in 1872–73, is a telescope of 110 feet diameter, of 450,000 cubic feet working capacity. The gas is sent out from their holders under a regulated pressure of from 10 to 19 tenths, and a daily diagram is filed at the office, of the work of the regulator (from Morris, Tasker & Co., of Philadelphia.)

We were most deeply interested by the subject of leakage and other sources of loss of gas, which have received very careful attention from this company. Their total loss was once very large but now averages not over 8 per cent. of make, and has been as low as 3 per cent. for an entire quarter. This result has been attained (1) by a systematic exploration of the street mains, joint by joint, over 400 leaks having been discovered in a single year. (2) By an equally rigorous scrutiny of consumer's meters—which have each been tested, and if found to vary 1 per cent. or more, sent to the maker to be corrected. It is a curious case of statistics which has been kindly supplied to us, that in 1873, in 3,097 meters tested, only 88 were found rating against consumers (that is, running too fast) while there were 477 rating against the company, and 12 were found not registering at all. This fact should help to overthrow the notion so common among consumers that companies forever conspire to defraud them through duplicity of meters. In New Haven if any gas consumer enters a complaint of his meter in the complaint book, always open to his use, he is invited to attend and witness the proof of its error, or accuracy, without expense. Each meter now bears a sealed number its full history is known; and can be exhibited at any moment. The average gas product in this company has been steadily increased from 9,200 feet per 2,240 lbs. of coal, in 1869, to 9,300 in '72, 9,870 in '73, and about 11,000 in '74.

The street mains have been enlarged and extended to nearly 60 miles, the value of large sized mains having been been clearly demonstrated, in diminished leakage, and an increased consumption.

Lime purification is used at New Haven, the company burning its own lime from oyster shells at a cost of about 7 cents per bushel, the cost of purification not exceeding 2½ cents per thousand feet of gas. They are so situated as to find use in filling water lots with the refuse lime without annoyance to the city.

[An unexpected pressure upon our space has cut this article short, crowding out a number of paragraphs already in type. We shall therefore pursue the topic, and present some further interesting points, in the next issue.—ED.]

THE PETROLEUM-GAS QUESTION.

We are bound to add our quota to the discussion of questions of the day which touch so vitally the present and the future of the gas-interest, as this, and whatever phantoms dire and shapes of dread we may thus conjure up, it is the duty of this journal, as an independent organ of public discussion, to be cowed down by none of them. Woe be unto us, if we preach not the Gospel of Progress.

At the same time, let us here condescend to assert, that we have no predilections in favor of mere novelty, in the abstract; and entertain even all due regard for the prejudices of conservative gentlemen who prefer, themselves, to walk in beaten paths, and who, like Mr. McIlhenny, do not believe in an age of progress. Such views we shall treat with all respect; the opinions of this school standing before the public on the same ground with our own, and being entitled to exactly the same hearing.

Indeed, our most earnest desire is that gentlemen of this school should speak out. We wish the public to hear them. *We* believe in the possibility of progress; and we want to know, and to be able to tell the public, what is to be said on both sides, and to give the people the means of judging as to its attainment for themselves—which they will do, in spite of conservatists and progressists; and which it is better they should do, if possible, on the testimony of those who are competent to speak understandingly on both sides of any mooted question of the day. It is plain that in this way, the debate at the recent meeting of the Gas-Light Association is the very thing the public needs, and should have. This we have put before the people, line by line and precept on precept. Therein our duty is fulfill

ed, and now we have a right to put forward our own views, and draw our own deductions.

Loved we "the thrift that follows fawning;" and were we to be cowed down by "vested interests," and submit, or seek, to be an "organ" of all or any of these—is it possible that the *material* interests of this journal might have been better served? We *do not believe it.* It is our firm persuasion that this journal would thus have sunk at once to the degraded rank of a mere "advertising circular," that its influence and consideration, built up for it by long and painful effort, would have died out, and that its very existence would ere this have come tn an ignominious termination. Whereas we have the satisfaction of announcing to the American gas-fraternity that their Journal is now rapidly being recognized, as never before, abroad, if not yet at home, by the most eminent of the profession in Europe; and as it is a principle fixed by all experience that reputation and success with the American people, certainly in all that relates to Science and the Arts, must first be founded *in Europe*, we have thus a solid augury for the future of the AMERICAN GAS-LIGHT JOURNAL.

We propose to-day therefore to present a few paragraphs, in introduction at least to a serious editorial discussion of the relative merits and advantages of gas-coal and rock-oil, both for enriching and for making, gas for illumination.

Probably it will be advantageous first, then, to present the points of the discussion which, in our own humble and individual opinion, have been founded on or at least tinctured with traditional prejudice; thus clearing away, once for all, what we may venture to call cobwebs, that obstruct a clear view of the facts, figures, and fixed principles that—even in the face of neglect from many of those best qualified to grapple with the subject—have nevertheless been arrived at.

First—: let us give a few words to the most common and the most plausible of the stock arguments of the antagonists of petroleum; that its supply is precarious. Mr. McIlhenny infers, from the fact that the trade has latterly diminished somewhat, that the natural supply is on the wane. We do not so read the logic of events. The testimony is universal that it is merely because the production had been so much overdone, a year or two since, that the oil was at one time worth less than the cost of conveying it to market. To condense this part of the subject as much as may be, we would say that it has no important or permanent bearing on the question, one way or the other, as we view it. Admitting what we have never yet found admitted, by any one who knows the oil country—that there will ultimately be a running down of productiveness which will *in itself*, independent of demand, necessitate an advance of price, we do not think the most prejudiced would deny that this must be a very gradual and protracted process, requiring decades, if not indeed centuries. There will be plenty of time, when the enhancement of average cost—in spite of the opening of new oil-fields, of the great improvements and economies which in the interim are going to be effected in obtaining a maximum yield for a minimum capital, and in creating oil-ducts and vehicles which will deliver the oil to the maximum distance at the minimum cost—there will be time enough then, when this far-away time approaches, to go back to gas-coal. In fact, this argument appears, when viewed aright, to be totally unworthy of a practical man. If a gas man can get now gas which has cost him one dollar for half a dollar, he is not going to refrain from it, because half a century or more hence there is to be a rise in cost of raw material.

Another cobweb that we shall endeavor to brush away, is the argument that the new consumption of oil for gas is in itself inevitably going to elevate its market price, by enhancing enormously the demand. The flimsiness of this cobweb, when examined into, by the light of a little Science, is the most astonishing thing connected with this whole controversy. To show this, we may have space to get in a little arithmetic, which need be but brief. The present average "output" of oil is estimated at 25,000 bbls., equal one million gallons, per day. If we allow for one gallon, only 100 feet of 50 candle gas, this makes each gallon worth 1,000 candles, and estimating ordinary gas-coal at 30,000 candles per ton, then 30 gallons oil equals one ton coal and the above million is equal to 33,333 tons of coal daily, or to 333,330,000 feet of ordinary coal-gas. This is probably ten times the present gas-consumption in the United States. The general conclusion must be, that in the extreme case of an absolute displacement of gas-coal by petroleum, but ten per cent. of the present production would be absorbed. So much for that cobweb.

A CARD.

OFFICE OF THE GAYLORD IRON & PIPE CO.
CINCINNATI, November 12, 1874.

Editor of the GAS-LIGHT JOURNAL—

Sir: We find in your issue of the 2d of November the following:

"IRON PIPES–Though these are times of peace they are by no means 'piping times,' probably even in the oil country. But we nevertheless have the following:

"Dennis Long, of Louisville, has orders for ouer 200 miles of gas and water pipe. He is now running two shops, and gives employment to over 500 workmen."

"PER CONTRA.—From Cincinnati, on the other hand, we learn that Gaylord & Co., Newport, Ky., notified their workmen that owing to the dulness of times, and competition, they would reduce wages 10 per cent., on which the workmen, 250 in number, ceased work, September 17, and the factory closed."

This item is in no respect true, nor does it *at all approach the truth.* So far as we are concerned it does us great injustice, and should be corrected.

Two months since we reduced our labor 10 per cent. Before we were paying more than any of our neighbors, and we reduced to the same basis as Mr. Long and others paid. Our "union moulders, together with a few rammers and core makers struck, and part of the shop was *out one day.* The next morning every man went to work on the reduction, since which time we have been running steadily and with full force.

Our works have not been idle a day this year for want of orders, or from any cause, and are not likely soon to be. "Per contra."–Our books will show at the close of the season that we have made as heavy a tonnage as any pipe foundry in the West, though we are ready to congratulate our Louisville neighbors upon a large and good year's business.

Our "factory" is not closed, nor will it be, and we are ready to fill any order as promptly as ever.

GAYLORD IRON & PIPE COMPANY.

[The items above referred to by the Gaylord Iron & Pipe Company were merely newspaper clippings. We feel justified in suggesting that by publishing them in our columns we have given the parties interested what we deem a most desirable chance, to refute these false charges in the most effective manner.]

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Roman Cement,
Keene's Cement.
S. L, MERCHANT & CO.
Importer,s 76 South Street (Corner Maiden Lane), N, Y.
368-1y

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Sulphate of Ammonia.
MR. CATHELS, WHO HAS HAD EXTENSIVE EXPERIENCE during the last twenty years, in the manufacture of SULPHATE OF AMMONIA, is prepared to advise Gas Companies on this profitable mode of utilizing the Ammoniacal Liquor. Drawings, Specifications, and full details of working supplied. Terms on application to E. S. CATHELS Gas Works, Montreal, Canada. 371

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To Gas Manufacturers.
It has recently been discovered by actual tests, under various circumstances, that the
Steam Valve,
as manufactured by the
Huntoon Governor Co.,
and used in connection with the celebrated
Huntoon Steam Governor,
is owing to its peculiar Construction and extreme sensitiveness, equally meritorious when applied to Engines governed by Gas. They are acknowledged by those now having them in use, as superior to all others for that purpose.
Address for Circulars, referencee, etc.
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REDUCTION! REDUCTION!!
HAVING JUST RECEIVED FROM MR. E. S. CATHEL of Montreal, a fresh supply of his CAS CONSUMERS MANNAL AND RETORT SETTING pamphlet, we can now fill all orders for the same at once. Mr. Cathels has decided to reduce the price to correspond with the times, therefore for the future either of the above works will be forwarded, post paid, for **25** cents, or one of each for **50** cents. Send all orders to A. M- CALLENDER & CO.,
42 Pine Street, N. Y.

$30 per Dozen.

DEAN'S
NEW PATENT (1873)
Screening Scoop SHOVEL
FOR COKE, COAL, ASHES, AND OTHER SUBSTANCES.
The frames are 12 by 18 inches, with seven bars, and are made of the best malleable Iron. They can be wired between bars by an arrangement of holes a quarter of an inch apart, by an ordinary person, to screen any size substance desired. They are warranted to be the most durable and practical Screening Shovel made, or money refunded.
Reference—All New York Gas Companies and Hotels.
Price, $30 per Dozen.
Sample sent gratis to any Company, if desired.
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N. Y. Shovel Works, No. 1358 B'way, N. Y.
369-6m

Illustrated Circular of over 100 pages sent Free. 369-1t

Gas Items.

THE GAS COMMISSION.—Mayor Havemeyer, Comptroller Green, and Commissioner Van Nort, constituting the Municipal Gas Commission, met November 20th, and opened proposals for lighting the city with gas during 1875. Five bids were received, as follows:

New York Gas-Light Company—$12 per lamp, from the 1st of January to April, inclusive.

Manhattan—Same.

Metropolitan—$15 per lamp for the same period.

Harlem—$4.08 per lamp for January, $3·45 for February and March, and $2·97 for April—total $13·50.

Mutual—$38 per lamp for the whole year.

There being some doubt as to the regularity of the bid by the last named company no action was taken on the proposals. The awards will be made in a few days.

JERSEY CITY GAS NEWS.—The following is clipped from the Jersey City *Evening Journal* of Nov. 16th. We must not be held responsible for it, as we know nothing of its verity or falsity:

"One of the sources of irritability to Jersey City people, and most productive in 'cussing' and worriment and discomfort and inconvenience, is the almost entire lack of the gas supply during the early hours of the evening. The gas company are either too stingy, or too careless, or too independent, or too something, to furnish a sufficient supply of gas until long after dark. It is an outrage on the people, and should be rectified at once."

EXPLOSION OF GAS.—By an explosion at the gas works at Mount Sterling, Ky., November 18, two white men and one negro were instantly killed. The bodies were so burned as to be hardly recognizable. One or two other employees escaped. Two buildings connected with the works were destroyed. The loss is not stated.

FIRE IN A GAS WORKS.—A fire occurred on November 16, in the coal shed of the City Gas Company's Works, at Hochelaga, Montreal, which entirely destroyed the roof of the building, and damaged fourteen or fifteen thousand tons of coal. The damage to the building was about $4,000. It is insured for $1000 each in the Citizens and Royal Canadian Companies. The loss on coal is about $4,000; insured for $3,000 each in the Royal Canadian and Citizen's companies.

[Up to the time of going to press we have received no further advices relating to the last two items.]

American Gas Patent.

G. S. Dunbar, of Pittsfield, Massachusetts, has patented an improved automatic gas lighter and extinguisher, which consists of a metal case screwed on to the lamp post, which has a passage for the gas to pass along one side of the chamber to the burner, in which passage is a stop valve to shut off the gas and extinguish the light, when it is let fall by a cam, which is turned for the purpose by the clockwork contained in the chamber. The cam is connected to the shaft of the clock gear by its hollow journal, which extends from the gas passage into the chamber. The valve has a pressure spring above it for pressing it firmly on its seat when the cam lets it fall. Strong clock springs turn the train. A wheel turns the cam back to set at the same time that it winds up the springs. The extent to which it is turned back determines the time the clock will run before extinguishing the light, and the extent to which it is turned back is governed by an adjustable collar. The cam may be set for dropping the valve at any predetermined time by shifting the collar to the mark on a scale corresponding to the time wanted. A bar is provided with match-holding fingers to carry a match at the same time that it is used to wind up the clock, and strike it against a striking plate, and then present the burner to ignite the gas jet; thus allowing the winding and setting of the clock and the lighting of the gas all to be accomplished by one operation.—*Iron.*

The Late Great Drought.—From a report of William A. Whitehead to the Newark *Advertiser*, we learn that the late drought, which lasted from August 9 to September 16, was one of the severest on record, and the rainfall which succeeded it was almost unprecedented. Seven and eighty-three hundredths of inches of water fell in the four days of storm, which has not been exceeded in one storm save in August 1843, and April 1853, during a period of 31 years. The drought lasted 38 days, during which only 32½ 100ths of an inch of water fell. Previous great droughts were in 1840, from August 29 to October 22, 34 days; 1851, from August 20 to October 2, 44 days; 1853, November 18 to December 23, 35 days; 1859, October 10 to November 13, 34 days; 1864, June 9 to July 25, 46 days, and 1870, from August 14 to September 17, 34 days. Of these only that of 1853 exceeded the one of 1874, and that was in the winter. The effect of the great rainfall of September 1874, and the gentle manner in which it came, had the most extraordinary effect in revivifying the parched vegetation. The mean temperature of the month just mentioned was exceptionally high.

Wooden Pneumatic Despatch Tube.—The former dispatch tube which was laid between the Capitol and the government printing office in Washington, proved a failure. It was a cylinder of wood, bound together by iron bands, and covered with tar. It was placed so deep that the superincumbent earth crushed the tube. A new tube is now being laid, which, on the outside, is a rectangle twenty inches wide, and twenty-three inches high. On the inside, the corners being cut off, the cross section is octagonal. The inside hight is nineteen inches. To make this tube air-tight, it is first covered with tar. The carrier, which is to move through the tube, is made of zones of wood riveted together. There is an exhaust engine at one end of the tube. The carrier has travelled 1,000 ft. in 1½ minutes. The average grade as far as the construction has proceeded is about six feet in 100.

PRICES OF FOREIGN AND DOMESTIC GAS COALS.

[Reported Expressly for this Journal.]

DECEMBER 2, 1874.

DELIVERED IN NEW YORK.

English Cannel.			
Ince Hall	$17 00	@	18 00
Kirkless Hall	16 50	@	17 00
English Caking Coals.			
Newcastle Gas	$12 00	@	00 00
Liverpool caking	11 50	@	12 00
British Province Coals.			
Pictou			2 50
Block House—At Mines, $2 12, Gold			0 00
Caledonia—At Mines, $2 00, Gold			0 00
Little Glace Bay—At Mines, 1 87½, Gold			2 00
Lingan—At Mines, $2 25, Gold			0 00
Sydney—Old Mine			3 00
" Reserve Mine			2 25
" International			— —
(Duty, 15 cents per ton, gold. Freight to New York $2 25, currency. Cost of above coals delivered in New York, $5 25 @ $6 00½, currency.)			
Pennsylvania Coals.			
Penn Gas Coal—At Amboy	$7 00	@	0 00
Westmoreland—At Amboy	7 00	@	0 00
(In New York both the above coals $7 50)			
Shafton	7 50	@	0 00
Youghiogheny	7 75	@	0 00
West Virginia Coals.			
Murphy Run	$7 40	@	0 00
Despard	7 40	@	0 00
West Fairmont	7 40	@	0 00
American Gas Coal	7 40	@	0 00
Fairmont	7 40	@	0 00
Newburgh Orrel	7 40	@	0 00
Pinnickinick	7 40	@	0 00
Cloverhill of Virginia	6 00	@	6 50
McKenzie Compound Mixture			— —
American Cannel Coals.			
Peytona of West Virginia	$12 50	@	00 00
Darlington of Pennsylvania			— —
Cannelton Cannel			12 50
Red Bank—at Philadelphia			7 60
" —at South Amboy			9 00
Asphalts.			
Albertite of New Brunswick	$— 00	@	— 00
Ritchie Mineral of West Virginia	18 00	at Balt'e.	
Trinidad Bitumen	— —	@	14 05

The Waverly Coal and Coke Company of Pittsburgh, have contracted with the Pittsburgh Gas-Light Co. for 40,000 tons of their Youghiogheny coal, on private terms,

THE

PENN GAS COAL COMPANY

OFFER THEIR

COAL, CAREFULLY SCREENED,

AND PREPARED FOR

GAS PURPOSES.

Their Property is located in the Youghiogheny Coal Basin, near Irwin's and Penn Station on the Pennsylvania Railroad, and on the Youghiogheny River.

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PLACES OF SHIPMENT.

Pennsylvania Railroad, Pier No. 2 (Lower Side).
Greenwich Wharves, Delaware River.
Pier No. 1 (Lower Side), South Amboy, N. J.

366-1y

ARCHER & PANCOAST MAN'G CO.

DESIGNERS AND MANUFACTURERS OF ARTISTIC

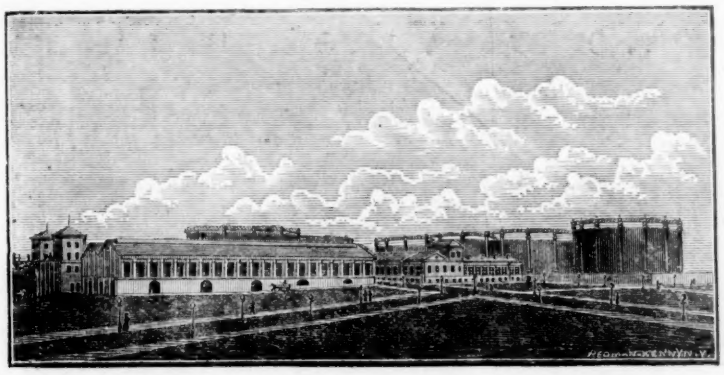
GAS FIXTURES,

AND IMPORTERS OF

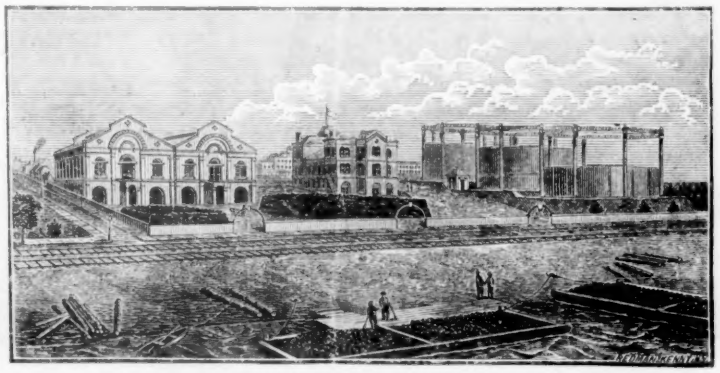
FRENCH BRONZES & CRYSTAL CHANDELIERS.

67 Greene Street, 68, 70, 72 Wooster St. } Above Broome.

New York.



CINCINNATI GAS-WORKS. ERECTED 1871-72-73.—WM. FARMER, ENG.



LACLEDE GAS WORKS, ERECTED 1872.—WM. FARMER, ENG.

WILLIAM FARMER,

ARCHITECT AND GENERAL GAS ENGINEER,

111 BROADWAY, TRINITY BUILDING, Room 95, New York.

WILLIAM FARMER may be consulted upon all matters connected with the construction of GAS WORKS, or any other description of buildings. Will furnish General and Detail Drawings, Specifications and Estimates for Gas Works of any capacity.

PATENTEE OF THE FOLLOWING INVENTIONS:

Exhausters for Gas and Foul Lime Ventilation,
Dumping Barrows for Coal, Coke and Lime,
Hydraulic Mains for Retort Benches,
Blowers for Forges, Foundries, &c.
Pumps for Water, &c., &c.

REFERENCES:

Professor SILLIMAN, New Haven, Conn.
GEN. CHAS. ROOME, President Manhattan Gas-Light Company, N. Y.
A. W. BENSON, President Brooklyn Gas-Light Company, Brooklyn, N. Y.
W. W. SCARBOROUGH, President Cincinnati Gas-Light Company, Cincinnati, Ohio.
S. L. HUSTED, President Laclede Gas-Light Company, St. Louis, Mo.
Prof. HENRY WURTZ, Editor AMERICAN GAS-LIGHT JOURNAL, N. Y.
GEN. A. HICKENLOOPER, Vice-President Cincinnati Gas-Light Co., Cincinnati, Ohio
FREDERICK CROMWELL, Vice-President Laclede Gas-Light Company. St. Louis Mo.
C. VANDERVOORT SMITH, Engineer Manhattan Gas-Light Company, N. Y.
JAMES R. SMEDBERG, Consulting Engineer, San Francisco Gas-Light Co., Cal.

GAS PURIFICATION.

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NEW IRON COMPOSITION

Has purified, per bushel, on a single test, 10,000 feet of Westmoreland Gas. With revivification lasts indefinitely. Surpasses in POWER and ECONOMY all known materials. Saves largely in FIRST COST, SPACE, LABOR, SUPERINTENDENCE, and all current expenses. Will purify *easily* sulphurous gas, wholly *unmanageable by lime.* Takes out *the monia.* Now operating in the following Gas Works: Harlem, New York (21st street); Port Morris; Hunter's Point; East New York Worcester, Lynn and Cambridge, Mass.; Lewiston, Maine; St, Albans, Vt.; Pawtucket, R. I.; Meriden, Ct.; and being introduced in many other places.

Cost 70 cents per bushel. One bushel for each square foot of Purifier sufficient. Rights to use for life of Patents, for daily makes of gas in thousands; under 25,000 $200; under 50,000, $400; under 100,000, $500; $250 additional for each additional 50,000 per day.

For further information and instructions, apply to
ST. JOHN & CARTWRIGHT,
21st Street and Avenue A, New York Gas Works.

☞ Immediate arrangements are urged, as the demand for the prepared composition is increasing *so rapidly* that delays in supply may occur.

B. S, BENSON.

MANUFACTURER OF

Cast Iron Pipes and Fittings,

AND

Gas and Water Mains.

All sizes from 3 to 30 inch cast vertically in 12½ feet lengths

Office & Factory 52 East Monument St.,
BALTIMORE, MD.

Having added a
SCOTT'S
GEAR MOULDING
MACHINE
To our Foundry, we are now prepared to furnish,
WITHOUT CHARGE FOR PATTERNS,
GEAR-WHEELS
OF ALL DESCRIPTIONS,
AT THE
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Work warranted perfectly accurate. Send for circular giving price, and directions for ordering.
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NEW YORK STEAM ENGINE CO. MANUFACTURERS OF MACHINIST'S TOOLS OF EVERY DESCRIPTION
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Cast and Wrought Iron Work

Used in the Erection of Gas and Coal Oil Works.

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Springfield, O., Gas Co.	Quincy, Ill., Gas Co.
Terre Haute, Ind., Gas Co.	Champaign, Ills., Gas Co.
Madison, Ind., Gas Co.	Carlinville, Ill., Gas Co.
Kansas City, Mo., Gas Co.	Bowling Green, Ky., Gas Co
Topeka, Kansas, Gas Co.	Hamilton, Ohio, Gas Co.
Burlington, Iowa, Gas Co.	Vicksburg, Miss., Gas Co.
Nashville, Tenn., Gas Co.	Denver City, Cal., Gas Co.

R. T. Coverdale, Eng'r Cincinnati, and others.

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Camden Iron Works

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MANUFACTURERS OF

ALL KINDS OF CASTINGS AND APPARATUS FOR GAS WORKS,

Wrought Iron Roof Frames,

For Retort and other houses Retorts and all castings required for setting them in the latest and most improve model. WASHERS, CONDENSERS, SCRUBBERS and EXHAUSTERS for relieving the Retorts from pressure. PURIFIERS, varyin from 2,000 to 2,000,000 cubic feet daily purifying capacity.

Wrought Iron Lime Sieves

for Purifiers. Station Meters of all sizes.

GAS HOLDERS,

TELESCOPIC AND SINGLE,

With cast iron guide and suspension frames. GAS GOVERNORS or REGULATORS, STREET MAINS, from 1½ to 48 INCHES DIAMETER, for WATER or GAS. Street Main connections, such as BRANCHES, BENDS, DRIPS, SIEVES, etc.

STOP VALVES, from 3 to 30 inches, for both Water and Gas.

Wrought Iron Work.

All the Smith and Sheet Iron work required in and about Gas Works. 226-tf

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FREEMAN BUTTS,

Of Cleveland, Ohio.

AND SHIPPER OF THE CELEBRATED AND ONLY GENUINE

Sterling Coal,

also dealer in YOUGHIOGHENY, PITTSBURGH, AND AMERICAN CANNEL. Would refer to the following Gas-Light Companies, who have used the HAND PICKED SELECTED COAL:

New York City, Manhattan and New York Companies, Brooklyn, Albany, Troy, West Troy, Rochester, Buffalo, Oswego, Ogdensburgh, Lansingburg, Newburg, Rome, Palmyra, Geneva, Yonkers, Rondout, Kingston, Albion, Brockport, Seneca Falls, Elmira and Lyons, n State or New York; Cleveland, Toledo, Sandusky, Norwalk, Oberlin, Salem and Fremont in Ohio; Detroit, Ann Arbor, Grand Rapids, Kalamazoo, Jackson and Adrian, in Michigan; Toronto, Hamilton, and Coburg, in Canada; Chicago, Ill., and two Companies in Milwaukee, Wisconsin.

Letters in reference to Coal should be addressed to the General Office of FREEMAN BUTTS, Cleveland, Ohio. 354

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Of West Virginia.

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Mines at Wilsonburg, Harrison Co., W. Va. Shipping Port, Baltimore.

This coal yields of Gas 11,200 cubic feet per ton of 2,240 lbs. and has an Illuminating Power of 16.30 st. candles. 350-3m

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Fire-Brick, Clay Gas Retorts,

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B.—Pipe from 3-inch and upwards, cast in 12-ft. lengths.

☞SEND FOR CIRCULAR AND PRICE LIST.☜

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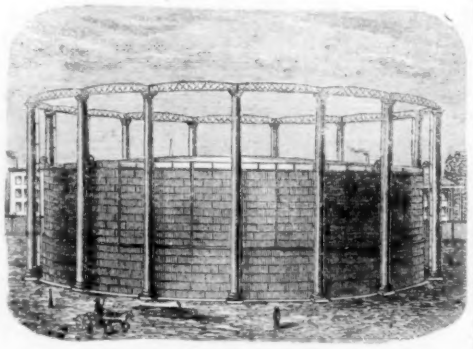

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Condensers, Scrubbers, Purifiers, Retorts, Hydraulic Mains, and all other articles connected with the Manufacture and Distribution of Gas, furnished with despatch. Plans and Specifications prepared, and Proposals given for the necessary Plans for Lighting Cities, Towns, Mansions, and Manufactories.

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Of Pittsburgh, Pa.

MINERS AND SHIPPERS OF

YOUGHIOGHENY GAS COAL.

This Company is prepared to furnish any amount of their justly celebrated, and acknowledged superior GAS COAL, to any point reached by railroad or navigation, on most favorable terms.

General Office—384 Penn Avenue, PITTSBURGH, PA.

Branch Office—C. & P. RR. Coal Pier, CLEVELAND, OHIO.

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351-1y

THE NEWBURGH

Orrel Coal Company,

Mines at Newburg, Preston County, W. Va.

Company's Office, No. 52 S. Gay Street, Baltimore, Md.

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This Company offer their very superior Gas Coal at lowest market prices.

It yields 10,996 cubic feet of gas to the ton of 2,240 lbs. of good illuminating power, and of remarkable purity; one bushel of lime purifying 6,792 cubic feet, with a large amount of coke of good quality.

It has been for many years very extensively used by various Gas Companies in the United States, and we beg to refer to the Manhattan, Metropolitan, and New York Gas Light Companies of New York; the Brooklyn and Citizen's Gas Light Companies of Brooklyn, N. Y.; the Baltimore Gas Light Company of Baltimore, Md., and the Providence Gas Light Company, Providence, R. I.

The best dry coals shipped, and the promptest attention given to orders. 294-1y.

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BRASS AND IRON SLIDE VALVES.

(Double and Single Gate ¼ inch to 36 inch—outside and inside screws, Indicator etc.) for Gas, Water and Steam—.

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ALSO

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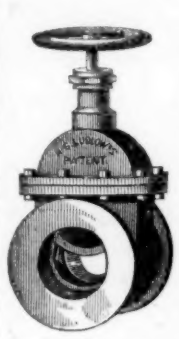

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MURRAY & BAKER,

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And Contractors for the Erection of Gas Works,

MANUFACTURERS OF ALL THE LATEST AND MOST IMPROVED APPARATUS AND TOOLS FOR THE MANUFACTURE & DISTRIBUTION OF COAL GAS.

☞ WORKS AT THE RAILWAY DEPOTS,

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We manufacture Bench Castings, Washers, "The Immersed Multitubular," and Atmospheric Condensers, Wet and Dry-Lime Purifiers, Dry Center Seals, Telescopic and Single Gas Holders, Wrought Iron Trussed Roof for Iron or Slate; Wood and Iron Trays for Purifiers, Coke and Coal Carts, Wrought Iron Screening Shovels and Castings, and Wrought Work of every description for Gas-Works.

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I. B. BRICE, Vice-President.
A. H. ALLEN, Secretary.
WM. J. VALENTINE, Treasurer.
GEORGE W. HARRIS, Engineer.

This Company is the owner of the GWYNNE-HARRIS, o AMERICAN HYDROCARBON process, for making Gas for Lighting or Heating purposes, by the perfect decomposition of superheated steam, under what is known as the

GWYNNE AND HARRIS PATENTS.

This process has been fully tested nearly 50,000,000 cubic feet of Gas having been made under it, and fully demonstrating the fact that it is the greatest improvement ever made in the manufacture of Gas, either for Lighting or Heating purposes. With half a ton of Anthracite Coal 150,000 cubic feet of Gas per day is made from three benches, and the labor is so small that one man can attend three or four benches.

The process can be put into either Coal or Oil Gas Works (or where both Coal and Oil are used) at small cost, without any interruption to the working of other benches. The Citizens Gas-Light Company of Brooklyn, after using it for more than seven months, have found it not only far better, but actually *cheaper* than atmospheric air in making Gas, with the use of "petroleum and its products."

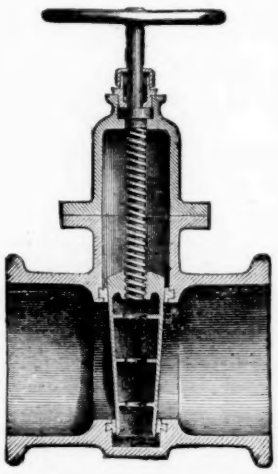
Further information, and terms of sale of rights will be given, upon application to the Company 348-1y

CHAPMAN VALVE COMPANY.

MANUFACTURERS OF

CHAPMAN GAS VALVES.

Office and Sales Room 75 and 77 Kilby Street, Boston.



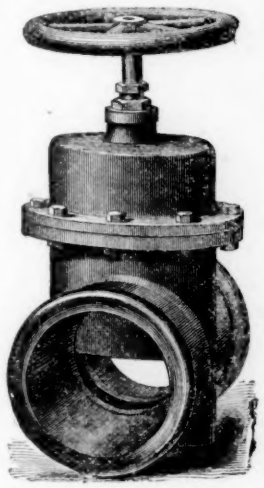
These Valves have been in use for several years, and are pronounced by all who have used them to be

The Best Gas Valves Ever Made.

They afford a direct passage the full size of the pipe. The seats are made of an alloy similar to BABBITT metal, specially prepared for the purpose, and superior to all other metals used for the seats of Gas Valves. It does not corrode under any circumstances to which it is exposed.

There is NO LIABILITY OF COHESION between the Gate and Seat, and the Valves can be relied upon to SHUT TIGHE and OPEN EASILY at all times—an important desideratum when used for street mains, in cases of fire.

We refer to the following named Gas-Light Companies among the many that have used these Valves:



BOSTON GAS-LIGHT COMPANY, BOSTON, MASS.
CAMBRIDGE GAS-LIGHT COMPANY, CAMBRIDGE, MASS.
NEWTON & WATERTOWN GAS-LIGHT CO., WATERTOWN, MASS.
LAWRENCE GAS-LIGHT COMPANY, LAWRENCE, MASS.
PEOPLES GAS-LIGHT COMPANY, BROOKLYN, N. Y.
CITIZENS GAS-LIGHT COMPANY, BROOKLYN, N. Y.
SOUTH BOSTON GAS-LIGHT COMPANY, BOSTON, MASS.
CHARLESTOWN GAS-LIGHT CO., CHARLESTOWN, MASS.
LYNN GAS-LIGHT COMPANY, LYNN, MASS.
FITCHBURG GAS-LIGHT COMPANY, FITCHBURG, MASS.
CITIZENS GAS-LIGHT COMPANY, NEWARK, N. J.
WILLIAMSBURGH GAS-LIGHT CO., WIRLIAMSBURGH, N. Y

GAS AND WATER VALVES ½ INCH TO 36 INCHES DIAMETER.
STEAM VALVES ½ INCH TO 12 INCHES DIAMETER.
357-tf

CANNELTON COAL COMPANY

Of West Virginia,

Offer to Manufacturers of Gas the pure Cannel Coal from their Colliery at Cannelton, West Virginia. This coal after having been thoroughly tried by the most expert and reliable Engineers, has shown itself to be the most valuable **Enriching agent** produced in this country—a gross ton yielding **10,000** cubic feet of gas, of **64.54** candle power, to purify which, required only two bushels of lime. The yield of coke is **32 bushels** of good quality, quite light, burns freely, making a very hot fire. For further information address

J. TATNALL LEA, Treas.,
P. O, Box 1747. No. 325 Chestnut Street, Phil'a.

PEYTONA CANNEL COAL

From West Virginia.

Yields over **13,000** feet of Gas per ton. At ten thousand feet (standard yield) the illuminating power is over **43** candles. Purifies **4,510** feet to the bushel of lime.

S. E. LOW, Secretary,
354 Office, 58 Broadway.

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PROVIDENCE Steam & Gas Pipe Co.,

PROVIDENCE, R. I.,

BUILDERS OF

GAS WORKS

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GAS-HOLDERS,

RETORT HOUSE ROOFS,
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COKE BARROWS,
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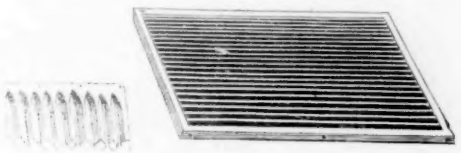

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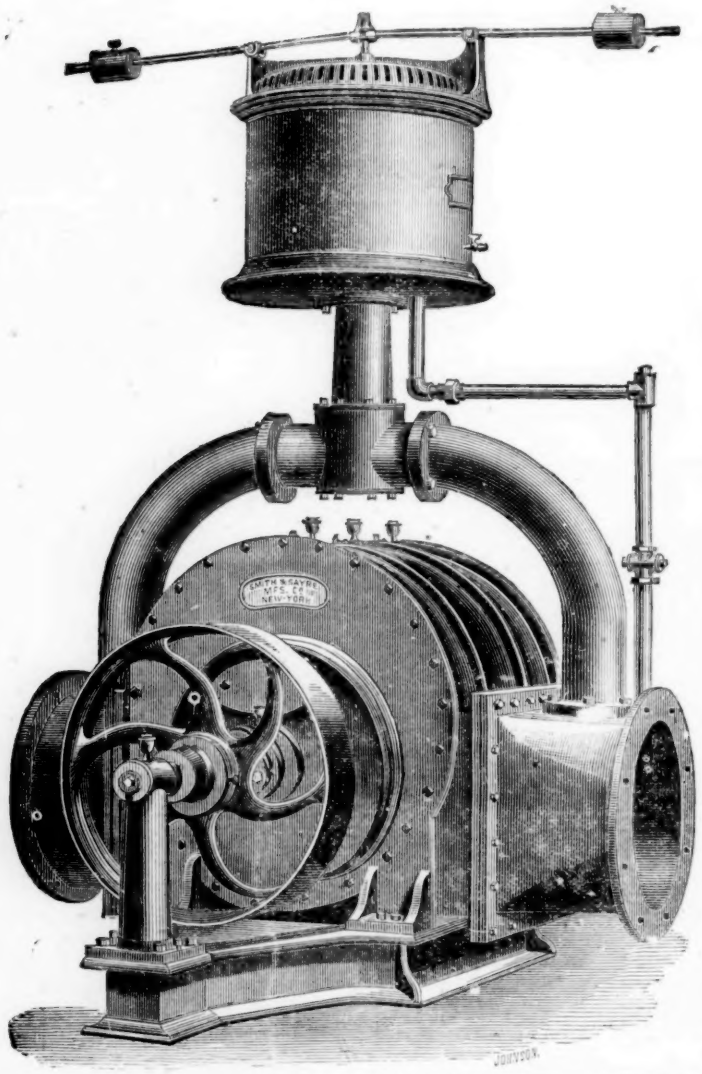

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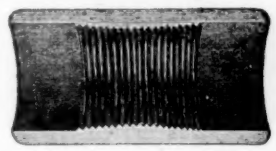

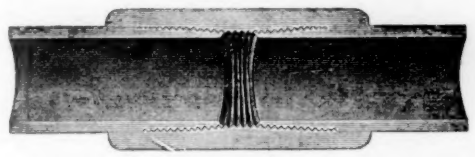

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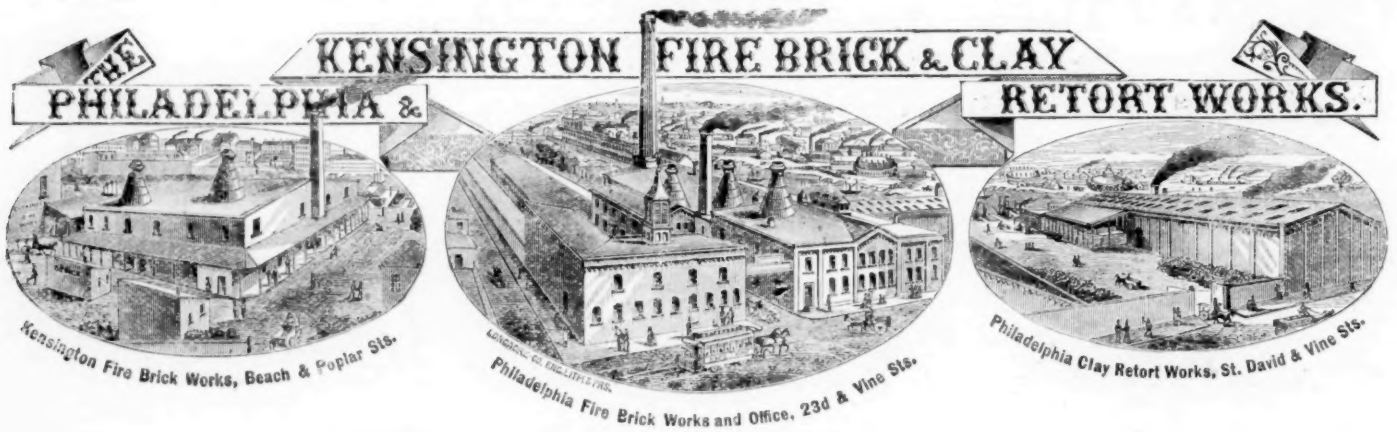
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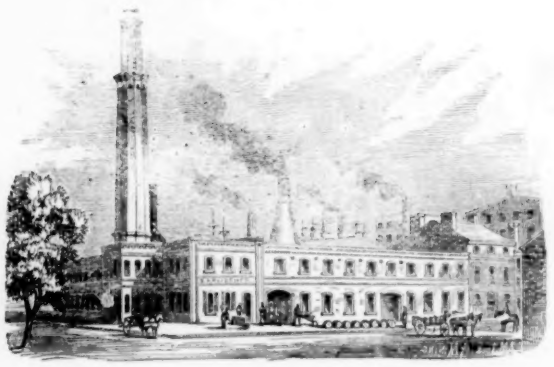

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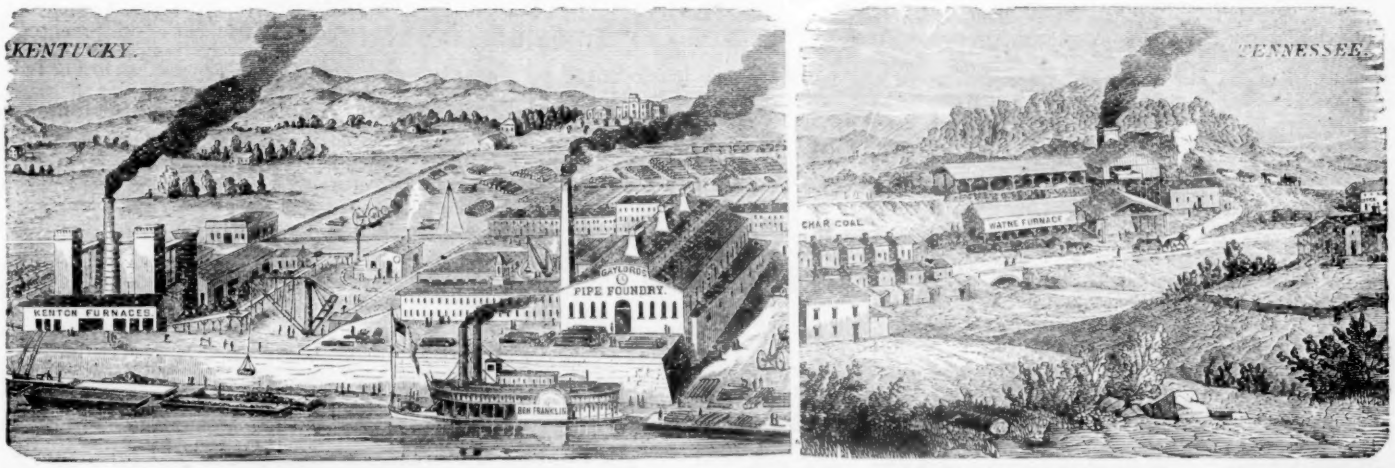

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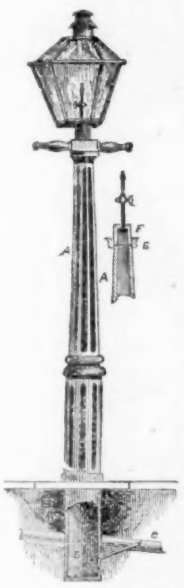

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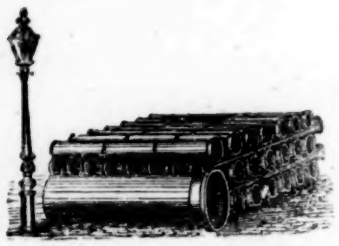

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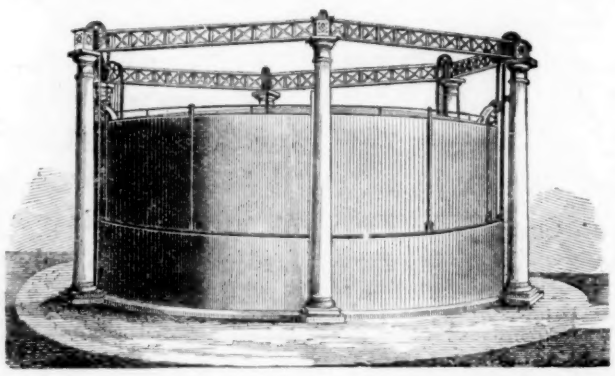

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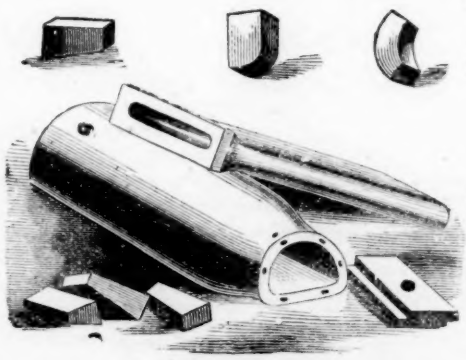

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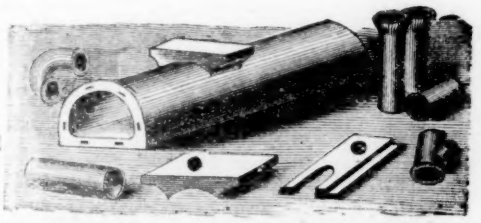

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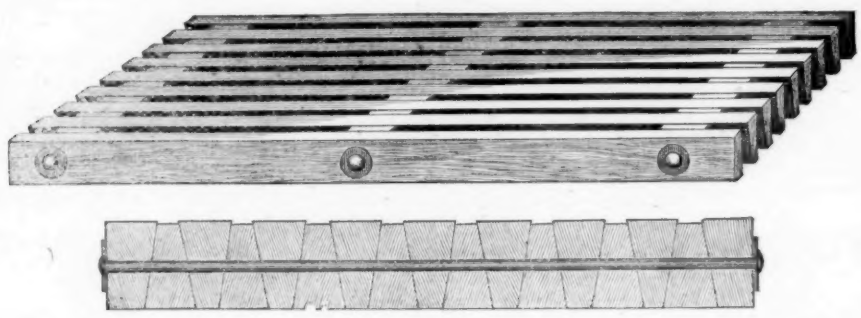

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